SYNERGY among ASEAN

PROCEEDINGS OF THE 19TH AFES CONGRESS 2017
The Biennial Scientific Meeting of the ASEAN Federation of Endocrine Societies

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The Organising Committee of AFES2017 would like to extend its warmest appreciation to the invited faculty & chairpersons, the ASEAN Endocrine Societies, the Endocrine Society, the International Society of Endocrinology, the volunteers and the industry sponsors for their support in this biennial educational programme.

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Preface

Dear Friends and Colleagues,

It gives me the greatest pleasure to welcome you to the 19th ASEAN Federation of Endocrine Societies Congress, 9 – 12 November 2017, Yangon (AFES 2017).

The Myanmar Society of Endocrinology and Metabolism (MSEM) joined AFES in 2011. We are honoured to be given the opportunity to host the AFES congress for the first time this year.

AFES Congress is a biennial congress that brings together endocrinologists, specialists, nurses and allied health practitioners to advance the knowledge and practice of medicine in the field of endocrinology and metabolism in the member countries. The congress has a rich scientific programme with 8 plenary sessions, 12 symposia and 12 meet the expert sessions covering an array of topics including but not limited to Adrenal glands, Aging Bone and Osteoporosis, Calcium and Vitamin D Metabolism, Diabetes, Lipids, Obesity, Paediatric Endocrinology, Pituitary, Pregnancy and Thyroid. A didactic and hands-on workshop on Thyroid is also designed for the delegates as pre-congress educational programme. The sessions are put together with the support of our sister societies in the Federation, namely, Indonesian Society of Endocrinology, Malaysian Endocrine and Metabolic Society, Philippines Society of Endocrinology, Diabetes and Metabolism, Endocrine and Metabolic Society of Singapore, Endocrine Society of Thailand and Vietnam Association of Diabetes and Endocrinology. This year, our partners, Endocrine Society and International Society of Endocrinology, also played a major role in shaping the academic sessions.

To date, the congress has grown beyond the member countries. More than 160 papers from 20 countries were received for oral and poster presentations. Apart from Asian region, the congress received papers from Europe and the USA.

The congress could not take place without our trade partners which we would like to take this opportunity to express our appreciation. And most of all we would like to thank the support of our faculty and participants who have taken the time off to attend this congress and make it happen.

We hope that all our partners and participants will take the opportunity to explore my beautiful country.

Welcome to Yangon and have an enjoyable and fruitful time in Yangon!

Professor Than Than Aye
President, ASEAN Federation of the Endocrine Societies (AFES)
President, Myanmar Society of Endocrinology and Metabolism
President, AFES2017
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24. Dr Ei Sandar Oo
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21st Century Treatment of Hyponatremia: More than Fluid Restriction .................. Assoc Prof Charlotte Hoybye PL4

Hyperparathyroidism: Update on Clinical Management and Disease Pathogenesis .... Dr Dolores Shoback PL5

Update on Cushing’s Syndrome ........................................................................ Dr Lynnette Nieman PL6

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Update in the Management of Hypercholesterolemia: Guidelines and Controversies Dr Ruby Tan Go S3.3

Symposium 4: Thyroid Disorders

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1Division of Nephrology, Department of Internal Medicine, Taoyuan General Hospital, 2National Yang-Ming University, 3Graduate Institute of Clinical Medicine, Taipei Medical University, 4Department of Medicine, National Taiwan University Hospital

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1Food and Nutrition Research Institute, 2Philippine Genome Center, 3National Institute of Molecular Biology and Biotechnology, 4Philippine Orthopedic Center, 5Mindanao State University – College of Medicine, 6University of the Philippines College of Medicine, Manila, Philippines,

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1Cho Ray Hospital, Hochiminh, Vietnam, 2Hà Nội Medical University, Hà Nội, Vietnam

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1Satyendra Nath Bose National Centre for Basic Sciences, Kolkata, India, 2Vivekananda Institute of Medical Science, Kolkata, India

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1University of the Philippines-Philippine General Hospital, Manila, Philippines, 2Department of Clinical Epidemiology, University of the Philippines Manila, Manila, Philippines, 3Department of Surgery, Asian Hospital and Medical Center, Muntinlupa City, Philippines

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1Geriatric Education and Research Institute / Singapore Institute of Technology, Singapore, 2Gerontology Research Program, National University of Singapore, 2Ng Teng Fong General Hospital, Singapore
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1Soochonwng University Gumi Hospital, Gumi, South Korea, 2Total healthcare center, Kangbuk Samsung Hospital, Sungkyunkwan University, School of medicine, Seoul, South Korea, 3Center for Cohort Studies, Total Healthcare Center, Kangbuk Samsung Hospital, Sungkyunkwan University School of Medicine, Seoul, South Korea

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Prof Kee Ho Song
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1University of Medicine 1, Yangon, Myanmar, 2University of Nursing, Yangon, Myanmar

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Department of Internal Medicine, Lerdsin General Hospital, Bangkok, Thailand

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Internal Medicine Department - Southern Philippines Medical Center, Davao City, Philippines

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Department of Physiology, University of Medicine, Magway, Magway, Myanmar

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Dr Mark Ramon Victor Llanes, Dr May Naranjo
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Prof Zerrin Orbak
Ataturk University Medical Faculty Department of Endocrinology, Erzurum, Turkey

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Prof Zerrin Orbak
Ataturk University Medical Faculty, Erzurum, Turkey

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Assoc Prof Marta Snajderova,1 Dr Petra Keslova,2 Prof Jan Lebl,1 Assoc Prof Jirina Zapletalova,3 Prof Petr Sedlacek2
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Dr Francesca Paula Bautista, Dr Stefanie Lim Uy-To
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Dr Julie Anne Gabat
Philippine General Hospital, Manila, Philippines

Fluconazole as a Viable Long-Term Alternative to Ketoconazole in Controlling Hypercortisolism of Recurrent Cushing’s Disease

Dr Amalina Haydar Ali Tajuddin, Dr Shu Teng Chai, Assoc Prof Dr Norasyikin A Wahab, Assoc Prof Dr Norlaila Mustafa, Prof Dr Norlela Shukor, Prof Dr Nor Azmi Kamaruddin
National University of Malaysia Medical Centre, Cheras, Malaysia

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Mrs Lenor Herrera
Chinese General Hospital, Manila, Philippines

Growth Hormone Control and Cardiovascular Function in Patients with Acromegaly

Dr Yi-Chun Lin, Prof Harn-Shen Chen, Dr Ching-Sung Kuo
Taipei Veterans General Hospital, Taipei, Taiwan

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Dr Tsai Li-Yu,1 Dr Hwang Ya-Min,1 Dr Chen Yu-Wei,1 Dr Lin Chin-Yao,1 Prof Lin Hong Da2
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Diabetes Insipidus as the initial presenting symptom in an Adult with Langerhans Cell Histiocytosis

Dr Annie Jane Sarmiento,3 Dr Christian Cesar Esplana,2 Dr Lina Frances Lanton-Ang,1 Dr Gracieux Fernando2
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1University of Malaya Medical Centre, Kuala Lumpur, Malaysia, 2Hospital Tengku Ampuan Rahimah, Klang, Malaysia, 3Hospital Kuala Lumpur, Malaysia

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Diabetes and Endocrinology, University of Medicine 1, Yangon, Myanmar

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Dr Yotsapon Thewjitcharoen,1 Dr Taweesak Srikummoon,2 Dr Nuchjira Srivajana,3 Mrs Panita Plianpan,4 Mrs Soontaree Nakasatien,1 Prof Thep Himathongkam1
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Dr Grethel Fatima Valera, Dr Hannah Corpuz, Dr Allan Corpuz, Dr Iriceel Cunanan, Dr Ruben Ervin Garcia
Ilocos Training and Regional Medical Center, City of San Fernando, Philippines
PL1
Year in Adrenal

Prof William Young
Division of Endocrinology, Diabetes, Metabolism and Nutrition,
Mayo Clinic, USA
Representative of the Endocrine Society

Plenary 1 - Year in Adrenal,
10 November 2017, 8:30 AM - 9:15 AM

An adrenal-based literature review covering the past 18 months will be completed. The 5 most impactful publications will be selected for presentation. At the time of abstract submission, the most likely articles to be discussed will include:

- The articles supporting the role for 68-Ga DOTATATE PET/CT in imaging malignant pheochromocytoma and paraganglioma.
- The SPARTACUS Trial on Adrenal Vein Sampling versus CT Scan to determine Treatment in Primary Aldosteronism: An Outcome-based Randomised Diagnostic Trial (Lancet Diabetes Endocrinol. 2016 Sep;4(9):739-46).
- The Utility of DHEA-S for the Detection of Subclinical Hypercortisolism in Patients with Adrenal Incidentalomas (J Clin Endocrinol Metab. 2017 Mar 1;102(3):786-792).
- A Recent Report on Malignant Pheochromocytoma and Paraganglioma in 272 patients over 55 years (J Clin Endocrinol Metab. 2017 Jun 12. [Epub ahead of print])

“Year-in” presentations are always very subjective and I apologize in advance for not highlighting some of the articles that would also deserve mention in this forum.

PL2
Cell Signaling in Insulin Secretion: A Path for the Improved Diabetes Treatment

Prof Susumu Seino
Kobe University Graduate School of Medicine, Japan

Plenary 2- Cell Signaling in Insulin Secretion: A Path for the Improved Diabetes Treatment,
10 November 2017, 9:15 AM – 10:00 AM

Insulin secretion from pancreatic β-cells plays the central role in the maintenance of glucose homeostasis; its impairment contributes to the pathogenesis and pathophysiology of diabetes and is a target for treatment of the disease. Glucose-induced insulin secretion (GIIS) is the primary mechanism of insulin secretion. In addition to glucose, neuro-hormonal amplification is critical in normal regulation of insulin secretion. Hormones and neurotransmitters exert their effects on insulin secretion mainly through G-protein coupled receptor-mediated signals. The incretins glucagon-like peptide 1 (GLP-1) and glucose-dependent insulinotropic polypeptide (GIP), which are secreted from enteroendocrine cells in response to meal ingestion, amplify insulin secretion through cAMP signaling in pancreatic β-cells. Incretins potentiate insulin secretion by Epac2A-dependent as well as PKA-dependent mechanisms. Although sulfonylureas, widely used anti-diabetic-drugs, stimulate insulin secretion primarily by inhibiting ATP-sensitive K+ (KATP) channels in the β-cells, the discovery that Epac2A is also a direct target of sulfonylureas enhances our understanding of sulfonylurea actions and their better use in treatment of diabetes. Recently, we demonstrated that β-cell glutamate produced through the malate-aspartate shuttle linked to glycolysis is a key signal in incretin-induced insulin secretion (IIIS) (Cell Rep, 2014). Defects in IIIS in diabetic or obese animal models are well correlated with impaired glutamate production in pancreatic islets. These studies may underlie the mechanisms of the impaired IIIS seen in type 2 diabetes and provide novel approaches to treatment of patients unresponsive to incretin therapies, so called incretin non-responders.

In this lecture, cell signaling in insulin secretion and its clinical implications will be discussed.
Hyponatremia is defined as serum concentration [Na+] < 135 mmol/L. It is the most common electrolyte disturbance affecting up to 15-30% of hospitalised patients. Hyponatremia results from loss of sodium with secondary water retention (hypovolemic); from excess of body water (euvolemic, including syndrome of inappropriate antidiuretic hormone secretion (SIADH)); and from renal sodium and water retention (hypervolemic). Hyponatremia can be mild (130-135 mmol/L), moderate (125-129 mmol/L) or severe (<125 mmol/L). Finally, hyponatremia can be acute (<48 hours duration) or chronic (>48 hours duration). Hyponatremia might present with neuro-cognitive symptoms, but the clinical presentation is varied and related to a multitude of underlying diseases and therapies.

The diagnostic approach is often complex. SIADH is a diagnosis of exclusion based on essential criteria; namely serum and urinary osmolality and urinary sodium. Vasopressin is difficult to measure. Co-peptin (a product from cleavage of the vasopressin prohormone) might be a new marker especially for differentiation between SIADH subtypes.

Several strategies exist for the correction of [Na+] and treatment is chosen based on duration and symptoms. Acute hyponatremia with cerebral oedema or other severe neurological symptoms is treated with hypertonic saline (3% NaCl). Fixed bolus doses of 100-150 ml hypertonic saline simplify treatment. Fluid restriction is the first line treatment for most forms of chronic hyponatremia. However, implementation is often difficult and compliance poor. Fluid restriction is only effective when urinary sodium plus potassium are less than serum [Na+]. If fluid restriction fails Vaptans might be used. Vaptans inhibit V2 receptors in the kidney and have in several randomised controlled trials been shown to normalise [Na+] in SIADH and improve symptoms of hyponatremia. Another treatment is urea which induces an osmotic diuresis and increases free water excretion. It has similar efficacy and side effects but a disadvantage is the poor palatability.

The brain adapts to hyponatremia to protect itself from cerebral oedema. A too rapid correction of serum sodium might lead to osmotic demyelination syndrome (ODS). To avoid this it is generally accepted that the rate of serum [Na+] correction in chronic hyponatremia should be limited to around 10 mmol/L in 24 h or 18 mmol/L in 48 h. In case re-lowering of serum sodium is needed hypotonic fluids and desmopressin is recommended.

In summary hyponatremia is common. The diagnostic approach is complex and several strategies for correction of [Na+] exist. Hyponatremia is associated with increased morbidity and mortality and is therefore important to identify and treat.
Primary hyperparathyroidism (PHPT) is a classic endocrine disorder of parathyroid hormone (PTH) hypersecretion resulting in hypercalcemia, hypophosphatemia, progressive bone demineralization, renal stones, and along with possible gastrointestinal, neuromuscular and behavioral changes, all depending on the chronicity and severity of the underlying hypersecretion. PHPT occurs at all ages, and the age of presentation strongly affects the underlying etiologies that must be considered. The most common form of PHPT presents in middle-aged to elderly patients, typically postmenopausal women, and its etiologies have yet to be elucidated. Likely there are multiple causative factors contributing to disease onset post-menopause. Data from epidemiologic cohorts suggest there is a predilection for PHPT in women with habitually low calcium intake, while other population-based studies support the idea that low serum levels of vitamin D metabolites like 25-OH vitamin D are intimately involved in the ultimate size of the parathyroid tumors and the severity of the HPT that occurs in such patients.

Despite these nutrition-based etiologic factors, genetic disorders must often be considered as an etiology for PHPT, regardless of the age of the patient. The younger the age of presentation, however, especially if less than 40 years, the more imperative it is for the clinician to consider genetic etiologies including multiple endocrine neoplasia type 1 and 2, the hyperparathyroidism jaw tumor syndrome, and disorders of extracellular calcium-sensing including familial hypocalciuric hypercalcemia (FHH) types 1-3. FHH is being increasingly recognized as a condition that can present with moderate hypercalcemia. Previously it was thought that mild, asymptomatic and benign (uncomplicated) hypercalcemia were the rule in FHH. Patients with the different forms of FHH are often not be completely free from the complications of hypercalcemia and elevated PTH levels. FHH is due to at least 3 distinct genetic defects: mutations in the coding sequence of the extracellular calcium-sensing receptor (CaSR), in the alpha subunit of G11, or in the adapter protein subunit 2 (AP2S), which fundamentally alter the relationship between serum calcium and PTH levels. Thus, more extensive genetic testing is now needed, to be sure FHH is excluded.

PHPT most commonly occurs in middle-aged to elderly women, and the majority (50-80%) of contemporary patients have little of the classic symptomatology. Surgery by an experienced operator can cure as many as 95% of patients. Not all patients require surgery. Recent guidelines for management of asymptomatic PHPT recommend risk stratification by assessing bone mineral density, presence of fractures or silent renal stones, and the level of kidney function, with a recommendation for considering surgery if estimated glomerular filtration rate is < 60 ml/min. If an individual cannot safely undergo surgery due to co-morbidities or has failed an initial procedure, then treatment of patients with osteoporosis can be undertaken with bisphosphonates. Hypercalcemia can also be effectively reduced, and in many cases normalized, in 80-90% of patients with PHPT with the calcimimetic cinacalcet as a chronic medical therapy. This agent has been used for over 5 years in open-label studies showing maintenance of bone mass and stable levels of renal function and serum calcium over time. Advances in imaging using PET scanning and highly sensitive tracers continue to be made and hold promise to enhance the ability to localize tumors in ectopic locations and in those individuals with recurrent and/or genetic disorders requiring multiple procedures to achieve permanent cure.
PL6
Update on Cushing’s Syndrome

Dr Lynnette Nieman
National Institutes of Health Program in Reproductive and Adult Endocrinology, Eunice Kennedy Shriver National Institute of Child Health and Human Development
President of the Endocrine Society

Plenary 6 - Update on Cushing’s Syndrome, Room 8,
11 November 2017, 1:30 PM - 2:15 PM

Recent findings have increased our understanding of problems related to the use and interpretation of tests for the diagnosis and differential diagnosis of Cushing’s syndrome (CS). At the same time, the number of possible medical treatments for CS have increased. The introduction of late night salivary cortisol measurement improved the ability to detect CS, but we now recognize that co-morbidities of age, hypertension and diabetes reduce its specificity. The introduction of structural assays (e.g. mass spectrometry) for urine cortisol has increased our confidence that we are measuring only this hormone. However, when urine cortisol is measured by this technique, the sensitivity for the diagnosis of CS decreases. This may occur because there is no cross-reactivity of metabolites in the structural assays as opposed to the immunoassay techniques. This cross-reactivity may elevate the apparent cortisol level and thus amplify the amount of detected over-activity of the axis. The necessity for sustained hypercortisolism to ensure suppression of normal corticotropes during testing for the differential diagnosis is increasingly apparent, especially as more patients are recognized with cyclic hypercortisolism. Different MRI protocols yield very different abilities to detect pituitary corticotrope adenomas. IPSM results suggest when lateralization is most reliable, and when the test may be falsely negative. Finally, recently introduced pituitary-directed agents, cabergoline and pasireotide, offer new options for medical treatment of Cushing’s disease patients who cannot undergo surgery, have persistent disease, or who recur. Similarly, the glucocorticoid antagonist mifepristone, provides a novel treatment option for patients with CS who have diabetes or hypertension.

DAY 2

PL8
The Metabolic Significance of Brown Adipose Tissue in Adult Humans

Prof Ken Ho
Princess Alexandra Hospital, University of Queensland, Australia

Plenary 8 - The Metabolic Significance of Brown Adipose Tissue in Adult Humans,
12 November 2017, 9:15 AM - 10:00 AM

Brown adipose tissue (BAT) plays a key role in energy homeostasis, protecting animals against hypothermia and diet-induced obesity. The role of BAT in adult humans is poorly understood. Research had been hampered by the mistaken belief that it disappears during infancy. BAT is present in all adult humans. BAT can be detected by diagnostic positron emission tomography (PET) scanning and by infrared thermography. BAT activity correlates positively with resting energy expenditure and negatively with obesity. BAT activation by repetitive cold exposure significantly reduces body fat and improves insulin sensitivity. BAT contributes significantly to diet-induced thermogenesis. Suppression of BAT thermogenesis leads to an increase in postprandial lipogenesis. These findings provide strong evidence for a significant role of BAT in energy balance and substrate metabolism. As cold exposure is unlikely to be an acceptable mode for treating obesity, considerable research is being undertaken to understand human BAT physiology to identify factors that stimulate its activity. With more than 90% of time spent in sedentary, non-exercise related energy expenditure is the major contributor to total energy expenditure in modern society. Harnessing the thermogenic potential of BAT offers a novel approach for combating obesity.
Steroids or glucocorticoids (GCs) are drugs that are now increasingly used in clinical practice to treat a variety of acute and chronic inflammatory and autoimmune diseases. Although usually well-tolerated, especially if used over short durations, their usage is associated with several side-effects, including fasting and postprandial hyperglycemia. Significant hyperglycemia most often occurs when high doses of GCs are taken by persons with known diabetes, but may also occur at moderate doses in persons with prediabetes, those with a history of gestational diabetes, and in those not previously known to be at risk. This unwanted hyperglycemic effect is generally attributed to the reduction of insulin sensitivity at the muscle, liver and adipose tissue, direct inhibitory effects on beta-cell insulin secretion, and increased fat accumulation and free fatty acid release from visceral adipocytes. Challenges in managing GC-induced diabetes stem from wide fluctuations in post-prandial hyperglycemia and the lack of clearly defined treatment protocols. Therefore, it is important to gain a better understanding of the pharmacokinetics and pharmacodynamics of different GCs, and to identify high risk populations. A treatment strategy is proposed based on previous studies of different types of GCs and the understanding of the mechanism of their actions in both the ambulatory and the hospital setting. The mainstay of successful treatment of GC-induced diabetes is early detection, risk modification, and the use of insulin therapy (either premixed or basal bolus regimens) coincident with meals, although recent data suggest that there may be a role of GLP-1 agonists and DPP-4 inhibitors.

Glucocorticoid-induced adrenal insufficiency (GCAI) is common side effect of glucocorticoid. Its prevalence ranges from 10% to 70%. GCAI is caused by suppression of Hypothalamic-Pituitary-Adrenal (HPA) axis function due to negative feedback of glucocorticoid usage. Its presentations could vary from subtle forms with no cushingoid features to overt forms of exogenous Cushing. The key to diagnosis of GCAI is to carefully take history of exposure to exogenous glucocorticoids. Confirming GCAI requires the following tests: low morning plasma cortisol or no responsiveness to stimulatory tests of HPA axis. Patients suspected of having GCAI should only be tested when they are on physiological dose of glucocorticoid (less than 5 mg to 7.5 mg a day of prednisone or 15 mg to 20 mg a day of hydrocortisone, or the equivalent) or after they stop glucocorticoid. An initial step to evaluate HPA axis reactivation is to measure morning cortisol. 8 AM plasma cortisol less than 3 μg/dL (83 nmol/L) is consistent with suppression of basal cortisol secretion from HPA axis. If morning cortisol is more than 20 mcg/dL, HPA axis function is recovered. If values are between 3 to 20 mcg/dL, stimulatory tests of HPA axis are required. Short 250 μg ACTH stimulation test is most commonly performed. Peak plasma cortisol >20 μg/dL (550 nmol/L) after this test shows that adrenal gland function is normal and glucocorticoid may be withdrawn. The insulin tolerance test and the metyrapone test can accurately assess the entire HPA axis, however they are cumbersome to perform and are therefore not routinely used.
S2.1
What's New in GDM 2017?

Dr Abel Soh
Diabetes, Thyroid and Endocrine Clinic, Singapore

2.1 - What's New in GDM 2017?,
10 November 2017, 10:20 AM - 12:00 PM

Gestational diabetes (GDM) is a common complication of pregnancy that increases the risk of maternal and fetal/neonatal complications. GDM is associated with macrosomia, shoulder dystocia and birth trauma, and stillbirth. Women with GDM are at increased risk for cesarean section and gestational hypertension/preeclampsia. Achieving good maternal glycemic control is the key to optimizing maternal and fetal/neonatal outcomes.

The screening strategy and diagnostic criteria of GDM have been disparate with different countries/organizations employing different tests and criteria for diagnosis. There was a compelling need to develop diagnostic criteria based on the specific relationships between hyperglycemia and the risk of adverse outcomes as none of the criteria used was formulated based on pregnancy outcomes.

In 2008, the Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) study showed continuous graded relationships between higher maternal glucose levels and increasing frequency of maternal and fetal/neonatal outcomes. The International Association of Diabetes and Pregnancy Study Group (IADPSG) proposed new criteria for diagnosis of GDM, based on HAPO.

The new diagnostic criteria have been adopted by many countries/organizations, including the World Health Organization (WHO). Subsequent studies demonstrate a 1.03 to 3.78-fold increase in the prevalence of GDM with IADPSG criteria versus baseline criteria. Studies are underway to determine the impact of the IADPSG criteria on maternal and fetal/neonatal outcomes in pregnancy.

S3.1
Genetic Regulation of Dyslipidemia in Asians

Prof Weerapan Khovidhunkit
Chulalongkorn University, Bangkok, Thailand

3.1 - Genetic Regulation of Dyslipidemia in Asians,
10 November 2017, 10:20 AM - 12:00 PM

Lipid levels are regulated by both genetic and environmental factors. Genetic factors regulating HDL cholesterol, triglyceride, and LDL cholesterol levels are distinct among different races and ethnic groups. In Thailand, we initially explored the genetic variants of several genes involved in the regulation of HDL cholesterol levels in subjects with very high levels of HDL-cholesterol. We found several novel rare variants in the CETP and LIPC genes, which encode cholesteryl ester transfer protein and hepatic lipase, respectively. Other common variants similar to those found in other Asian populations were also identified. These variants are different from those found in Caucasian populations. In vitro functional studies confirmed that these variants were pathogenic. In subjects with severe hypertriglyceridemia, several rare and common variants in the LPL, APOA5, and GPIHBP1, which encode lipoprotein lipase, apolipoproteins A5, and glycosylphosphatidylinositol high-density lipoprotein-binding protein1, respectively, were also found. These studies highlight ethnic-specific genetic variations in the regulation of circulating lipid levels. More importantly, a large fraction of patients who had no identifiable genetic variants in known genes suggests that new genes regulating lipid levels remain to be discovered by newer techniques in the future.
Diabetic dyslipidemic pattern consists of increase in triglycerides, VLDL and small dense LDL and Apo B and decrease in HDL and Apo A. The mechanism of diabetic dyslipidemia is believed to be due to insulin resistance causing elevated levels of FFA by adipose tissue which promotes lipoprotein synthesis by the liver resulting in the dyslipidemia. The prevalence of diabetic dyslipidemia in the Asian population is about 90-95%. Diabetic dyslipidemia is not only a cause of macrovascular disease but is also associated with microvascular disease, as through various pathways, it causes atherosclerosis, alterations in coagulation-fibronolytic system, changes in membrane permeability and damage to endothelial cells. Lipid lowering therapy has not only been shown to reduce the rates of macrovascular disease but also microvascular disease. The FIELD study had shown that lipid lowering therapy significantly lowered retinopathy, nephropathy and foot amputation and the ACCORD-Eye study showed a significant reduction in retinopathy.

In summary, diabetic dyslipidemia is very common and is associated with increased rates of macrovascular and microvascular complications. Treatment of diabetic dyslipidemia has been shown to reduce both macrovascular and microvascular complications.

The American College of Cardiology/ American Heart association and the European Society of Cardiology guidelines recommend statins as the primary lipid lowering agent for primary and secondary prevention of cardiovascular disease based on randomized clinical trials. There is considerable overlap between the two guidelines. The population based Rotterdam study compares the two guidelines and noted that often the guidelines did not align at the individual level. However, for one fifth of the general population, they recommend statin initiation with trial data supporting the efficacy. In patients unable to reach the LDL target goals or with statin intolerance, exetimibe is generally the second drug of choice followed by bile acid sequestrants. In patients with familial hypercholesterolemia (FH) with very high LDL, statins may not be adequate. PCSK9 monoclonal antibodies have been shown to reduce LDL cholesterol by 40-70% on top of background therapies with good safety data.

The recently presented ACCELERATE trial surprised many experts by failing to show any CVD benefit of evacetrapid inspite of marked LDL cholesterol lowering with increase in HDL cholesterol in high risk patients with CAD. This trial challenges the validity of the cholesterol hypothesis and the utility of cholesterol as a surrogate end-point.

The benefits of statins outweigh its risks. Some issues regarding statin safety include myopathy and muscle pain, hepatic enzymes elevation, increase risk of type 2 diabetes and alzheimer’s disease; these are often exaggerated by social media.

Myopathy with rhabdomyolysis and renal decompensation although rare is the most serious adverse effect. Muscle complaints with or without mild CK elevation is more common but may not necessarily be due to statin.
Symposia

Transient elevations in hepatic transaminases usually do not indicate liver disease. Persistent elevations more than 3 times the upper limit of normal have been found in about 1% of people in clinical trials although severe liver damage is rare.

Statins increase the risk of new onset diabetes mellitus by about 10% in patients treated with moderate potency statins and by about 20% in those treated with high potency statins. Other symptoms such as memory loss, erectile dysfunction, tendinitis and peripheral neuropathy have also been attributed to statins but have no firm basis.

S4.1
Thyroid Nodules: Consensus and Controversy

Prof Hossein Gharib
The Mayo Clinic, Minnesota, USA

4.1 - Thyroid Nodules: Consensus and Controversies, 10, November 2017, 10:20 AM - 12:00 PM

This presentation includes a critical review and commentary on the recently published guidelines by the AACE and ATA, as well as, a discussion of a recent survey on management of thyroid nodules.

We will discuss risk of malignancy assessment by history, physical exam, US and FNA. The AACE developed a 3-tier system for US risk assessment vs a 5-tier system used by the ATA. We shall review the conventional 4-class cytologic classification, the risk of malignancy in a benign FNA, and compare with the 6-class Bethesda Cytologic Reporting System (BCRS) now commonly used, and their impact on nodule management.

The role of molecular markers in nodule evaluation is evolving rapidly. Several molecular markers are now commercially available for use in indeterminate cytology; the guidelines differ in recommending their application.

We shall discuss criteria on how to select nodules for FNA. Recently, some have advocated active surveillance for nodules <1 cm with suspicious US appearance, whereas others favor performing FNA and proceeding with surgery if malignant.

Finally, we will compare the risk of cancer in solitary vs MNG, and discuss alcohol ablation for benign thyroid cysts.

S4.2
Genetics and its Clinical Relevance in Autoimmune Thyroid Disease

Dr Tjokorda Gde Dalem Pemayun
University of Diponegoro, Dr Kariadi General Hospital, Semarang, Indonesia

4.2 – Genetics and its Clinical Relevance in Autoimmune Thyroid Disease, 10 November 2017, 10:20 AM - 12:00 PM

The genes that confer susceptibility to AITD can be classified into two groups including MHC and non-MHC. Human Leucocyte Antigen (HLA) is associated with both Graves’ disease (GD) and Hashimoto’s thyroiditis (HT). The HLA region is a highly polymorphic region that contains many immune response genes and to be associated with various autoimmune disorders. Non-MHC genes can be classified into (1) immune-regulatory genes (CD40, CTLA-4, PTPN22); and (2) thyroid-specific genes (thyroglobulin and TSH receptor genes). The cytotoxic T lymphocyte-associated protein 4, (CTLA-4), gene is located on chromosome 2q. It is a highly polymorphic gene that was first discovered to be associated with risk for AITD. The CD40 molecule, located on chromosome 20q, its present on the surface of antigen presenting cells (APCs) including B cells, has identified strong linkage of CD40 to GD. The protein tyrosine phosphatase-22 (PTPN22) gene encodes for the lymphoid tyrosine phosphatase (LYP), similar to CTLA-4, functions to inhibit T cell activation. A novel zinc-finger gene, (ZFAT), as one of the AITD susceptibility genes in 8q23-q24. Fc receptor-like 3 (FCRL3) is one of five FCRL genes that are preferentially expressed on B-lymphocytes in GD. In GD have shown evidence for linkage at putative X-chromosome loci, Xq21 and Xp11. The Xp11 has also been linked to other autoimmune disorders. The thyroglobulin (Tg) protein is the major thyroidal protein antigen and a locus on chromosome 8q24 that was linked with AITD. The TSHR gene is located on chromosome 14q and it was found to be associated with GD.
Management of Thyroid Cancer

Prof Won Bae Kim
University of Ilsan College of Medicine, Seoul, South Korea

4.3 - Management of Thyroid Cancer,
10 November 2017, 10:20 AM - 12:00 PM

Thyroid cancer incidence has been rising worldwide recently. Well differentiated thyroid carcinomas (WDTC) being composed of PTC and FTC comprise about 95 percent of thyroid cancers and comprise about 90 percent of thyroid cancer mortality.

Standard treatment modality of WDTC is surgery of optimal extent with or without radioiodine (RAI) therapy and thyroxine (T4) suppression. Standard initial therapy cures the disease in many patients with WDTCs. However, recurrence occurs in up to 30 percent of patients and up to 10 percent of patients succumb to their disease.

Radioiodine therapy after curative surgery is used to destroy residual thyroid cancer cells, to identify distant metastasis reducing recurrences and disease specific mortality, as well as to remove remnants of normal thyroid tissue maximizing sensitivity and specificity of serum thyroglobulin test and diagnostic radioiodine scan during follow up.

Medical follow up of patients who had undergone primary therapy should be adequately done with physical examination, radioiodine scan, serum Tg and various imaging studies including neck ultrasonography to find residual or recurrent diseases.

Treatment of patients with recurrent RAI-refractory disease is a challenge to physicians caring the patients. Local recurrences or distant metastatic lesions may be treated by surgery if resectable, or by external beam radiation therapy, or other local modalities.

Tyrosine kinase inhibitors (TKI) may be used for locally advanced or metastatic RAI-refractory DTC’s and those having potential efficacy. I would review efficacy of TKI's including recently published results of DECISION trial and of SELECT trial.

Novel Molecular and Regulatory Mechanisms in Cushing’s Syndrome

Prof André Lacroix
University of Montreal, Canada

5.1 – Novel Molecular and Regulatory Mechanisms in Cushing’s Syndrome,
11 November 2017, 10:20 AM - 12:00 PM

Chronic exposure to excess glucocorticoids results in the diverse manifestations of Cushing’s syndrome, including debilitating morbidities and increased mortality. Recent advances in whole genome/exome sequencing have greatly accelerated our understanding of the molecular mechanisms of tumorigenesis leading to excess cortisol secretion by primary adrenal lesions and of ACTH from corticotroph tumors.

These include USP8 mutations in 50% of corticotroph tumors leading to increased levels of EGF receptor mediated secretion of ACTH. Various mechanisms have been uncovered which lead to reduced glucocorticoid receptor negative feedback.

Maintenance of hypercortisolism in primary adrenal Cushing’s syndrome despite the suppression of ACTH secretion by the pituitary results from germline or somatic mutations in a variety of genes in the cAMP pathway as well as from aberrant expression and function of several G-protein coupled hormone receptors. PRKACA mutations are involved in a high proportion of cortisol secreting adenomas. Germline ARMC5 mutations and aberrant receptor regulated paracrine production of ACTH are frequent in bilateral macronodular adrenal hyperplasia. PRKAR1A mutations are the most frequent cause of primary pigmented nodular adrenal disease and Carney’s complex.

The development of new targeted drugs interfering with the molecular causes should offer clinicians several choices to better treat patients with residual cortisol excess. However, the long-term effects and co-morbidities associated with hypercortisolism require ongoing care of patients affected by this challenging syndrome.
S5.2
Therapeutic Objectives in Acromegaly

Prof Ken Ho
Princess Alexandra Hospital, University of Queensland, Australia

5.2 - Therapeutic Objectives in Acromegaly,
11 November 2017, 10:20 AM - 12:00 PM

Acromegaly increases mortality and causes substantial morbidity. Life expectancy is reduced by 10 years, and this reduction strongly correlates with the level of residual biochemical disease activity. The goals for treatment of acromegaly is to restore GH hypersecretion to normal and to achieve complete tumour removal without compromising pituitary function.

Surgery remains first line therapy for small resectable tumours. It has an important role for large tumours and invasive tumours even when the prospect of surgical cure is remote, because appropriate adjuvant medical treatment can achieve tight control.

Three classes of drugs are available to treat acromegaly: dopamine agonists, somatostatin analogues and GH receptor antagonist. Dopamine agonists have a limited adjunctive role in disease control. Somatostatin analogues have gained a firm place in therapy, controlling hypersecretion and tumour growth in 30-50% of patients. Pasireotide, a second generation analog targeting a wider spectrum of somatostatin receptor subtypes is more efficacious but increases the risk of diabetes. Pegvisomant, a GH receptor antagonist normalizes IGF-1 in nearly all patients but does not control tumour growth. SERMs and oestrogens, both of which inhibit GHR signaling, have a useful adjuvant role in controlling mild residual disease.

Radiotherapy remains an important adjuvant treatment where other modes are contraindicated or have failed.

Acromegaly remains a challenging disease to manage. The expanding range of therapeutic options has brought better outcomes and offers the potential to tailor therapy to individual requirements.

S5.3
Hypopituitarism in Tropical Countries

Prof Than Than Aye
Bahosi Hospital, University of Medicine 2, Yangon, Myanmar

5.3 - Hypopituitarism in Tropical Countries,
11 November 2017, 10:20 AM - 12:00 PM

The important causes of hypopituitarism are pituitary tumors (including craniopharyngioma), postoperative and postradiotherapy states, vascular conditions, autoimmune diseases such as hypophysitis, and infectious/inflammatory lesions. Unlike in the west, snake bite and Sheehan’s syndrome (SS) are included in the list of the causes of hypopituitarism in tropical countries.

Hypopituitarism following Russell’s viper bite has been described from a restricted geographical area only i.e. South India, Myanmar(Burma) and Sri Lanka. Pituitary failure can occur during the acute stage or chronic after months to years. Russell’s viper, Vipera russelli is a leading cause of fatal snake bite in Pakistan, India, Bangladesh, Sri Lanka, Burma, and Thailand. Each year in Myanmar, 10,000 people are found to be bitten by snakes, and the mortality rate resulting from snake bite is 1000 persons per year. People envenomed by these snakes suffer coagulopathy, bleeding, shock, neurotoxicity, acute kidney injury and local tissue damage leading to severe morbidity and mortality. Those who have history of severe envenomation have higher risk for developing hypopituitarism in future.

The various possible mechanisms proposed for the pituitary damage following snake bite include thrombosis of pituitary vessels as a part of DIC leading to ischemic pituitary infarction. Apart from that damaged vascular endothelium, impaired platelet function, depletion of clotting factors, and secondary fibrinolysis leading to pituitary hemorrhages are also suspected.

The anterior pituitary is affected more commonly than the posterior pituitary. An atrophic pituitary gland or empty sella may be seen on imaging. Snakebite in the tropics continues to be a neglected disease and the hypopituitarism as a consequence of snake bite is poorly recognised in clinical practice.

Sheehan’s syndrome is another neglected hypopituitarism in developing countries. It is still a significant problem in the developing countries compared to developed countries due to many reasons, especially obstetric care. Sheehan’s syndrome often evolves slowly and hence is diagnosed late.
History of postpartum hemorrhage, failure to lactate and cessation of menses are important clues to the diagnosis. Autoimmunity has been suggested to play a role in the pathogenesis of SS. Sheehan’s Syndrome can present after many months to years following the inciting delivery and remain undiagnosed for many years. The main involvement is the secretion of growth hormone (GH) and prolactin (90–100%), while deficiencies in cortisol secretion, gonadotropin and thyroid stimulating hormone (TSH) range from 50 to 100%. Paradoxically, there are also reports of patients with hyperprolactinemia and galactorrhea and normal or mildly elevated serum TSH.

The general principle of treatment of hypopituitarism can be applied for these conditions. The goal of therapy is to replace deficient hormones. Treatment is important not only to correct endocrine abnormalities, but also to reduce mortality due to hypopituitarism. In developing countries, the hormones replaced are mainly focused on glucocorticoid, thyroid, and for selected cases, sex hormones due to socioeconomic reasons. Early case detection by keeping high index of suspicion is of utmost importance for hypopituitarism due to both post viper bite and Sheehan’s syndrome.

**S6.1 Testosterone in Hypopituitarism, Benefits and Risks**

Dr Kyaw Kyaw Soe  
*University of Texas Southwestern Medical Center, Dallas, USA*

**6.1 - Testosterone in Hypopituitarism, Benefits and Risks, 11 November 2017, 10:20 AM - 11:10 AM**

Testosterone deficiency after pituitary surgery or due to mass effect of pituitary tumors in male patients is a common clinical scenario. However, hypogonadism among hypopituitarism patients especially elderly males are overlooked and were not treated properly due to concern for long-term safety of testosterone therapy.

Many people regarded major benefit of testosterone replacement therapy as sexual function only and underestimated the non-sexual benefits such as musculoskeletal benefit and anemia improvement. Non-sexual benefits are well proven effects of testosterone replacement therapy.

In this lecture, the speaker will discuss about benefit and risk of testosterone replacement therapy for male patients with hypopituitarism, treatment options of testosterone replacement and monitoring of treatment.

**S6.2 Testosterone Treatment in Transgender**

Prof K O Lee  
*National University of Singapore*

**6.2 - Testosterone in Transgender, 11 November 2017, 11:10 AM - 11:40 AM**

Female to male transgender patients are increasingly presenting to Endocrinologists for assistance in their hormonal therapy. In the ASEAN countries, legal and cultural restrictions differ, and the availability of preparations of testosterone differ. However, patients will usually have obtained masculinising androgen preparations from non-medical sources, often cross-border - more often oral preparations as injectable preparations are more difficult to obtain. The preparations of testosterone available often include injectable Testosterone cyclopropionate (Depo-Testosterone), Sustanon (mixture of Testosterone esters) and oral testosterone undecanoate. Testosterone gels are usually too expensive for these patients. Patients may often have inaccurate and inadequate information on the use of the preparations they have access to, and may be completely unaware of the correct dose, and the potential harm of over dosage. Thus, accurate, well informed and reliable information from the endocrinologist may sometimes be very valuable to the patient even when it is difficult or illegal to supply the drugs requested. Advice given in a neutral manner may also be very helpful in the education of these patients, especially regarding the potential side-effects and toxicity of over dosage on androgens. Blood investigations will also be useful to monitor the dose and potential toxicity in these patients. This presentation will survey the difficulties and dilemmas in providing medications to this group of patients. In ASEAN countries, some of these patients, if they achieve a satisfactory and stable dose of testosterone, are able to have stable lives and careers, even families with children.
Osteoporosis is one of the most prevalent endocrine diseases in the ASEAN region but familiarity with it and perception of its importance lag behind that of other common endocrine diseases such as diabetes. This talk will be clinical based and focus on the following:

- Osteoporosis facts and figures from the various ASEAN countries
- Clinical case studies to highlight the practical principles of management in various settings

Osteoporosis is a devastating disorder as a consequence of fragility fracture. It results from loss of bone mass and deterioration of bone microarchitecture. Although it can affect any bone, its most common sites are the hip, wrist, and spine. With increasing life expectancy, the prevalence of osteoporotic fractures is expected to increase, with a large proportion of it occurring in the Asia-Pacific region. Unfortunately, there has been an overall reduction in prescription of osteoporosis therapies of ~50% since the mid-2000s. This unfortunate trend is due to a combination of factors that include a lack of new therapeutic agents available for osteoporosis, and an aversion for use of bisphosphonates.

So, how should we manage our patients with osteoporosis? Adequate calcium, vitamin D and active lifestyle modification for optimal bone health are the cornerstone but are insufficient to prevent fractures. It has been clearly established that there is a need for initiation of active anti-osteoporosis therapies. The first-line treatment of women with osteoporosis is with either bisphosphonates or biologic agents, e.g. denosumab – with the aim of preventing the first fracture or more importantly, prevention of recurrent fractures. The level of evidence for the use of bisphosphonates/denosumab is strong, with high quality data to support their efficacy. In women with low bone mass (osteopenia), use of risk scoring such as FRAX with/without DXA is recommended to guide decision making.

The recommended duration for therapy with bisphosphonates is 5 years, with the potential to extend beyond 5 years, depending on the level of fracture risk. When denosumab is given, the duration of therapy may need to be longer, as there is an increased risk of fracture on cessation of therapy – appropriate follow-up treatment should be considered prior to stopping denosumab. Anabolic therapy continues to be restricted to those with severe osteoporosis, with multiple fractures or fracturing while on anti-resorptive therapies.

The key message is that osteoporosis continues to be under-estimated, under-diagnosed and under-treated: the consequence being that those affected will meet their undertaker earlier!
Congenital adrenal hyperplasia (CAH) is a life-long disorder with age and sex-specific management problems. In Paediatrics, management is targeted to titrate steroid replacement doses associated with optimal growth and puberty. Once growth is completed and pubertal maturation has been achieved, the youth (whose daily treatment was previously dictated by parents), now needs to assume increasing responsibility for managing his disease, so as to prevent the long term adverse outcomes of CAH, as well as optimization of fertility and sexual function.

This transition to adult endocrine care can be a difficult time, and the adolescent may encounter the following issues which need to be recognized and managed sensitively:

1. A poor understanding of CAH can result in variable compliance to steroid replacement, and the transition period provides an opportunity for an educational review to clarify concerns and importantly, to improve future adherence to treatment. Planned disclosure of the medical and surgical history should occur at an age-appropriate manner in a gradual process of reinforced education in childhood into the teenage years, with full disclosure by 16 years of age, so as to promote a trusting patient-doctor relationship.

2. During puberty, there is a need to adjust the steroid replacement, since increased cortisol clearance associated with increased growth hormone and IGF-1 during puberty can cause decreased glucocorticoid effectiveness. Moreover, an older teen or a young adult may encounter irregular lifestyle changes necessitating a change to a longer acting and more potent glucocorticoid (prednisolone or dexamethasone) with variable mineralocorticoid activity.

3. This is also a time to re-assess metabolic disturbances which may have developed in late childhood and which may precede other chronic problems such as obesity from steroid overtreatment, insulin resistance from hyperandrogenism and poor adherence, hypertension and cardiovascular disease.

4. For females, it is essential to deal with issues related to menstruation, sexuality and subfertility, arising as a consequence of hyperandrogenism.

5. For males, the important issues include subfertility (oligospermia and azoospermia), the potential for adrenal rest tumours in the testes, necessitating close monitoring and alternative treatment options.

6. As part of holistic transitional care, the psychosexual and psychosocial issues including social competence, as well as genetic counselling for CAH should be discussed with clarification of misconceptions which may have arisen from the early years.

The transition period for CAH is thus an opportune time for a full review of the multi-faceted aspects of the medical, surgical and psychological needs of the patient.
Symposia

S8.3
Growth Hormone Treatment-
Transition from Paediatric to Adult

Assoc Prof Charlotte Hoybye
Karolinska University Hospital, Sweden

8.3 - Growth Hormone Treatment - Transition from Paediatric to Adult,
11 November, 2017, 10:20 AM - 12:00 PM

The transition period refers to a broad set of physical and psychological changes, arbitrarily defined as starting in late puberty and ending with full adult maturation. This usually implies a period from mid to late teens until 6-7 years after achievement of final height. In patients with growth hormone (GH) treatment for GH deficiency (GHD) it has to be decided:

Whom to re-test: In most children with multiple pituitary deficiencies re-testing is not needed. In children with other etiologies it is recommended to discontinue GH treatment one month before testing. The cut-off level for severe GHD is set at <5 μg/L. Re-testing is usually performed by the pediatrician.

Which test to use: The most frequently used test is the insulin tolerance test, but glucagon and arginine-GH releasing hormone (GHRH) test might also be used.

Benefits and safety of continued GH treatment: After adult height is obtained maintenance of a favorable body composition, metabolic balance and quality of life is the goal. The longer the gap from discontinuation to resumption of GH treatment the more symptoms of GHD will develop. In general, long-term safety issues have not been reported in large studies.

A special group of patients are survivors of childhood cancers. Advances in anticancer treatments have greatly increased survival; however, after radiotherapy to the head and neck these patients are at a high risk for developing hypothalamic and pituitary dysfunction even after many years. Therefore, they need an endocrine follow-up for many years and continued in adulthood.

Close collaboration between paediatric and adult endocrinologist is important to ensure and facilitate transfer of care and a minimum of drop-out from follow-up. Local resources will determine the structure, but many hospitals have transitional centers with a team work between paediatrics and adult endocrinologists for the takeover to adult care.

DAY 3

S9.1
Management of Diabetes in Developing Countries

Prof Cecilia Jimeno
University of the Philippines College of Medicine, Manila, Philippines

9.1 - Management of Diabetes in Developing Countries,
12 November 2017, 10:20 AM - 12:00 PM

Diabetes among developing countries is significantly different from those of developed countries but is of high importance since the highest number of individuals with diabetes are in the Western Pacific and South East Asian regions. This presentation will attempt to answer the following questions: (1) what are the biologic or pathophysiologic differences of diabetes in the west versus Asians; (2) are there differences in the course of diabetes such as the development of complications between the west and Asia; (3) how do cultural differences and differences in health systems affect the way diabetes is managed in Asia compared to our western counterparts. Towards the end of the lecture, developments in the way that diabetes is being addressed in the ASEAN region will also be discussed.
S9.2
Update on Mass Clinical Trials

Assoc Prof Graham McMahon
Brigham and Women’s Hospital, USA

9.2 - Update on Mass Clinical Trials,
12 November 2017, 10:20 AM - 12:00 PM

Diabetes self-management education (DSME) is associated with improved diabetes knowledge and self-care behaviors, lower A1C, lower self-reported weight, improved quality of life, healthy coping, and reduced health care costs. DSME focuses on supporting patient empowerment by providing people with diabetes the tools to make informed self-management decisions, and has transitioned over time to being more patient centered and collaborative. Treatment goals and plans should be created with the patients based on their individual preferences, values, and goals. Treatment plans are most effective when they align with the Chronic Care Model, emphasizing productive interactions between a proactive practice team and an informed activated patient. The goal of provider-patient communication is to establish a collaborative relationship and to assess and address self-management barriers without blame. DSME standards call for an integrated approach that includes clinical content and skills, behavioral strategies (goal setting, problem solving), and engagement with psychosocial concerns. DSME should address healthy lifestyle choices, self-management, prevention of complications, and how to self-modulate behavior. DSME is increasingly facilitated by more sophisticated educational technology (including mobile technology), and endures through targeted educational approaches based on identified needs. This session will review best practices in the provision of effective DSME, including a review of strategies to become culturally-sensitive patient-centered, and effectively improve patient engagement, consolidation of learning, team formation, and introduce educational and communications technology to an endocrine practice.

S9.3
Gaps and Challenges in Diabetes Care in Myanmar

Prof Tint Swe Latt
Myanmar Diabetes Association

9.3 - Gaps and Challenges in Diabetes Care in Myanmar,
12 November 2017, 10:20 AM - 12:00 PM

In common with other low-income countries, diabetes is a growing challenge for Myanmar. The National Survey on the prevalence of diabetes (2013-2014) reported the prevalence of diabetes as 10.5% for the adult population aged between 25 and 65 years. The delivery of diabetes care in Myanmar is far from satisfactory. Chronic care model for diabetes cannot be practiced yet in Myanmar due to lack of resources. Challenges exist in political commitment, policy development, health system strengthening, health literacy and aligning the traditional medicine into diabetes care. Diabetes care needs to be integrated into the prevention activities of other major non-communicable diseases (NCD).

Existing initiatives for prevention of NCD are channeled vertically rather than being horizontally integrated. Primary health care is traditionally orientated more towards prevention of infectious diseases and staffs require training in prevention and control of NCDs. Retention of trained health workers, and assignment of duties appropriately according to their training also become a challenge and hurdle for diabetes care.

Myanmar Diabetes Care Model, which is based on the successful experience gained in the pilot project of WHO Package of Essential Non-Communicable Diseases interventions, has been proposed to overcome the gaps in diabetes care and equity issue. However, implementation of the diabetes model is still limited due to weak political commitment and visionary leadership as well as lack of resources.

Obviously, Myanmar needs to escalate effort not only to stem the tide of rising prevalence of diabetes, but also to achieve the targets set in the Global Action Plan for the prevention and control of NCDs 2013-2020.
S10.1  
Diabetes and Cancer: Insights into Genetic Susceptibility

Dr Aung Ko Win  
The University of Melbourne, Australia

10.1 – Diabetes and Cancer: Insights into Genetic Susceptibility,  
12 November 2017, 10:20 AM - 12:00 PM

Both diabetes and cancer are common diseases with increasing incidences worldwide. Epidemiologic evidence suggests that type 2 diabetes is associated with increased risk of several cancers including colon, rectum, breast, endometrium and pancreas. It remains unclear whether the diabetes-cancer association is direct (e.g., due to hyperglycaemia), or whether diabetes is an indication of underlying biologic factors that alter cancer risk (e.g., insulin resistance and hyperinsulinemia), or the diabetes-cancer association is indirect and due to personal and environmental / lifestyle risk factors common to both diseases (e.g., aging, obesity, poor diet, smoking, physical inactivity). Both diabetes and cancer are complex genetic traits, like other common diseases, with multiple genetic and environmental components contributing to disease susceptibility. Over the last decades, genome-wide association studies have identified common genetic variants, including single nucleotide polymorphisms (SNPs), that are associated with susceptibility to diabetes and different types of cancer. However, it is largely unknown whether genetic variants for diabetes also influence the risk of cancers, whether and how genetic variants interact with environmental factors in disease susceptibility, and how genetic variants together environmental factors are useful in personalised risk prediction of disease for precision medicine. In this lecture, I will present and discuss the current evidence of genetic susceptibility to diabetes and cancer.

S10.3  
The Genetic Study and Clinical Management in Subjects with Multiple Endocrine Neoplasia-1

Prof Tjin-Shing Jap  
Veterans General hospital, Taipei, Taiwan, ROC

10.3 - The Genetic Study and Clinical Management in Subjects with Multiple Endocrine Neoplasia-1,  
12 November 2017, 10:20 AM - 12:00 PM

Multiple Endocrine Neoplasia-1 (MEN1) is an autosomal dominant disorder resulting from loss of function of a tumor suppression gene- MEN1, located on the chromosome 11q. The gene comprises 10 exons that encode 610 aminoacids product- menin. Patients with MEN1 may develop parathyroid, enteropancreatic endocrine and pituitary adenomas in the non-synchronous manner. One of our studies was to analyze 9 patients with MEN-1 with clinical presentations and 52 family members and to determine the mutation in MEN1 gene. All probands had MEN1 gene mutations. Of all 20 symptomatic individuals studied, all had primary hyperparathyroidism (100%), 11 pancreatic endocrine tumors (55%) and 8 pituitary tumors (40%), including 6 prolactinoma, 1 growth hormone-secreting tumor and 1 non-secreting tumor. Pancreatic involvement was present in 11 affected subjects (55 %), including 4 insulinomas and 7 gastrinomas. Patients with MEN1 should be managed by a multidisciplinary team including relevant specialists in this field. Patients with MEN1 have a decreased life expectancy. The main aim of treatment is to maintain disease- and symptom-free and to maintain a good quality of life.

In conclusion, we have identified MEN1 gene mutation of nine Han Chinese kindreds with MEN1 living in Taiwan, including five novel mutations. The subjects with MEN1should be managed by a team of specialists from different disciplines.
Polyglandular autoimmune syndromes (PAS) are autoimmune endocrinopathies characterized by the coexistence of at least two endocrine gland insufficiencies. Two major subtypes of PAS, types 1 and 2, are distinguished according to the age of presentation, characteristic patterns of disease combinations, and different modes of inheritance.

PAS-1 is a monogenic disorder and is inherited in an autosomal recessive manner caused by mutations in the autoimmune regulator (AIRE) gene. It is also known as APECED (autoimmune polyendocrinopathy, candidiasis and ectodermal dystrophy). PAS-1 is diagnosed when a patient develops at least two of the following three conditions (so-called Whitaker’s triad): hypoparathyroidism, hypoadrenalism, and chronic mucocutaneous candidiasis. The onset of the disease is usually in infancy.

PAS-2 is more prevalent than type 1 syndrome. The inheritance of PAS-2 is complex, with genes on chromosome 6 playing a predominant role. PAS-2 is characterized by Addison’s disease with autoimmune thyroid disease (Schmidt’s syndrome) and/or type 1 diabetes (Carpenter’s syndrome). Primary adrenal insufficiency is its principal manifestation. It occurs later than type 1, usually presenting by age 40 years.

PAS-3 (also known as PAS-2b) is the co-occurrence of autoimmune thyroid disease with other autoimmune endocrine disorders or a nonendocrine autoimmune disorder in the absence of Addison’s disease.

Three major laboratory approaches are used to diagnose a PAS: serologic tests for autoantibodies, function tests for the secretion of organ-specific hormones, and genetic tests. The functional screening for autoimmune endocrine diseases of the first-degree relatives should also be considered.

Primary aldosteronism (PA) is responsible for 6-13% of human hypertension and increases rates of cardiovascular and other morbidities compared to essential hypertension. In addition to the common indications of screening (resistant hypertension, hypokalemia, adrenal incidentaloma, familial cases), recent guidelines recommend to screen all patients with new sustained hypertension (150/100 mmHg) and those with sleep apnea and hypertension. The most frequent causes of PA include bilateral idiopathic hyperplasia (IHA, 60-70%), and unilateral aldosteronoma (APA, 30-40%). This distinction was recently challenged by the findings of zona glomerulosa nodular hyperplasia adjacent to APA. Adrenal venous sampling (AVS) is useful in identifying which patients have lateralised source of aldosterone and should undergo unilateral adrenalectomy; controversy still exists on the performance and interpretation of AVS.

Somatic mutation in the potassium channel (KCNJ5) are found in 34-47% of APA, and similar germline mutations can be found in rare kindreds with familial PA type III; however no germline mutations are found in patients with sporadic APA or IHA. Somatic mutations in sodium and calcium ATPases (ATP1A1, ATP3B3) or in calcium channels (CACNA1D, CACNA1H) can be found in a small percentage of APA but not in IHA. All these mutations were shown to increase aldosterone synthase activity and aldosterone production.

Several studies also indicate that diverse G-protein coupled receptors (GPCR) can be aberrantly expressed and functional in APA and IHA. Increased expression of the eutopic ACTH-R (MC2R) and serotonin (HT4R) receptors are frequently found. In vivo and in vitro studies suggest the frequent aberrant expression and function of several other receptors including for LH, LHRH, vasopressin, B-adrenergic and GIP. One or several aberrant receptors can be aberrantly functional in adrenal tissues of patients with either IHA or APA.

It is possible that sequential interactions between initial aberrant GPCR and other somatic events including ion channels and beta-catenin mutations in aldosterone producing cell clusters (APCC) may explain the diversity of phenotypes of IHA and APA which are often developing adjacent to milder bilateral hyperplasia.
Pheochromocytoma (PHEO) is a rare adrenomedullary tumor causing secondary hypertension, with an incidence of 0.1-0.6%. These tumors can synthesize, metabolize, store, and secrete catecholamines and their metabolites. A high index of clinical suspicion remains the pivotal point to initiate biochemical studies, particularly in those patients with certain patterns of spells, blood pressure elevations (paroxysmal or alternating with hypotension), drug-resistant hypertension, sudden palpitations with or without pallor, unexplained sweating particularly at night or in cold weather, unexplained hyperglycemia, and a hereditary predisposition for PHEO. The clinical symptomatology is derived from the peripheral tissue effect of norepinephrine, epinephrine, and their by-products. Morbidity and mortality is increased due to the delay in the diagnosis and treatment. Although biochemical testing for PHEO is indicated for symptomatic patients as described above, it is also indicated for patients with incidentally found adrenal lesions or identified genetic predispositions or syndromic presentation pointing towards a high likelihood to develop PHEO (e.g., in patients with multiple endocrine neoplasia type 2 (MEN2), von Hippel-Lindau syndrome (VHL), neurofibromatosis type 1 (NF1), mutations of the succinate dehydrogenase genes (SDHB, SDHD), and hypoxia-induced factor 2A (HIF2A)-related PHEO-polycythemia syndrome). Only after PHEO is biochemically proven should imaging be performed.

Current imaging modalities include anatomical (CT, MRI) and functional (molecular) imaging procedures using various radiopharmaceuticals, depending on the clinical situation. If a detailed clinical assessment together with well-thought and appropriate diagnostic approaches is not applied, consequences from improper or delayed diagnosis of PHEO almost always occur. This may lead to catastrophic consequences from sudden catecholamine release and their impact on cardiovascular and other systems, including lethal tachyarrhythmia, myocardial infarction, stroke, or death, and significant myocardial dysfunction persisting even after normalization of catecholamine levels postoperatively.

During the last few years, new discoveries have been made in the diagnosis of PHEO, as follows: the inclusion of 3-methoxytyramine in the biochemical diagnosis, new reference values for sitting and standing metanephrine levels, and new reference values for children, metabolite profiling (metabolomics) and evaluation of relationships between metabolotypes and genotypes, in vivo proton magnetic spectroscopy for the assessment of catecholamines and succinate, the use of new functional imaging modalities particularly somatostatin analogs radiolabeled with gallium-68 (68Ga-DOTA-SSA) in the localization of PHEO, and finally the advancement in the identification and characterization of new susceptible genes related to disruption of HIF degradation, such as prolyl hydroxylase (PHD) and HIF mutations, mutations in chromatin remodeling genes, e.g., MERTK, MET, and H3F3A, and disruption in DNA copy numbers. Also, new therapeutic approaches are on the horizon focusing on HIF-2 inhibitors, hypomethylating agents, and 177Lu-DOTATATE for peptide receptor radionuclide therapy (PRRT) and precision medicine approach.
S12.1
Obesity and Obstructive Sleep Apnea

Dr Gabriel Jasul Jr
University of the Philippines College of Medicine, Manila, Philippines

12.1 - Obesity and Obstructive Sleep Apnea,
12 November 2017, 10:20 AM - 12:00 PM

Obesity and obstructive sleep apnea (OSA) are interrelated multidirectionally, involving complex mechanisms that lead to adverse cardiovascular and metabolic outcomes. It is estimated from reported studies that almost half of moderate to severe cases of OSA are attributed to excess weight. Weight reduction is therefore clearly needed in a significant number of OSA cases. The projected amount of weight loss to be of benefit with regards to OSA is at least 10% of baseline weight. The amount of weight loss has been evaluated in relation to improvement in OSA indices as well as quality of life.

Weight management in general is challenging. Many physicians are not well-trained in guiding and treating obese patients. Health care facilities are also often not well-equipped to manage obese patients. The treatment options for obesity are also not uniformly accessible. When the complications of obesity, including OSA and cardiometabolic problems, are already present, weight management even becomes more difficult. Practical steps in weight management through lifestyle intervention (diet, physical activity), behavioral modification, drug therapy and bariatric surgery will be highlighted vis-a-vis the limitations and challenges in clinical practice specifically as they relate to obese patients already with OSA and with cardiovascular and metabolic complications.

S12.3
Thrombosis in Endocrine Disorders

Prof Thein Hlaing Oo
The University of Texas MD Anderson Cancer Center, USA

12.3 - Thrombosis in Endocrine Disorders,
12 November 2017, 10:20 AM - 12:00 PM

Endocrine disorders (EDs) are an important cause of thrombosis. They may result in alteration of the Virchow’s triad leading to thrombosis. Hypercoagulability is a major mechanism by which many EDs contribute to thrombosis. While this lecture encompasses the pathophysiology of both arterial and venous thrombosis in EDs, it mainly focuses on the management of venous thromboembolism (VTE).

Many benign hypofunctional and hyperfunctional EDs induce dyslipemia, hypertension, atherosclerosis, hypercoagulability and impaired fibrinolysis leading to arterial and venous thrombosis. Iatrogenic causes of hyperestrogenism such as oral contraceptive pills or antineoplastic agents (e.g. tamoxifen) are also an important cause of thrombosis.

Endocrine malignancies contribute to thrombosis by inducing not only hypercoagulability but also endothelial injury and stasis. Endocrine tumors produce tissue factor, cancer procoagulants and cytokines which stimulate the coagulation pathway, activate platelets and endothelium by various mechanisms.

To reduce the risk of thrombosis, high-risk acutely ill hospitalized patients with EDs should receive pharmacologic thromboprophylaxis for the duration of hospitalization and/or until fully mobile. Once VTE develops, anticoagulants are administered to stabilize the thrombus, prevent embolization and reduce the recurrent VTE risk. While many anticoagulants can be used in benign EDs for the treatment of acute VTE, the low-molecular-weight heparin remains the standard of care in the treatment of cancer-associated thrombosis (CAT).

While direct oral anticoagulants have been approved for many indications in the last 7 years, their role in the prevention and treatment of CAT remains unclear. Many research trials are underway in the CAT category.
In this meet the expert session we will discuss several patients with incidentally discovered adrenal masses. An adrenal incidentaloma is defined as a mass lesion >1-cm in diameter that is serendipitously discovered by radiologic examination, in the absence of symptoms or clinical findings suggestive of adrenal disease (Young, 2007). The adrenal incidentaloma must be characterized with respect to: a) functional status with history and physical examination and hormonal assessment; and b) malignant potential with “imaging phenotype” and size.

Functional Status: The evaluation should start with a history and physical examination focusing on signs and symptoms of adrenal hyperfunction and underlying extra-adrenal malignancy. Consider case-detection testing for: subclinical Cushing syndrome (also referred to as “subclinical glucocorticoid secretory autonomy”); pheochromocytoma; and, primary aldosteronism in patients with hypertension. Thus, the key tests include: 24-hr urine for fractionated metanephrines and catecholamines; DHEA-S and the 1-mg overnight dexamethasone suppression test; and, if hypertensive or hypokalemic, morning levels of plasma aldosterone and plasma renin activity.

Malignant Potential: Imaging phenotype does not predict hormonal function; however, it does predict underlying pathology, and surgical resection should be considered in patients with adrenal incidentalomas that have a suspicious imaging phenotype.

Follow-up: All patients should have at least one follow-up image—even if the radiologist calls the mass an “adenoma.”


Thyroid functions changes in pregnancy are profound and complex. TSH is the best thyroid test and trimester specific ranges are available. Targeted but not universal screen is recommended.

Management of subclinical hypothyroidism (SCH) is a matter of debate and it is not established that SCH adversely affects normal fetal development. ATA endorses LT4 therapy for SCH in early pregnancy, considering it both safe and potentially beneficial. Data is insufficient to determine if LT4 reduces pregnancy loss in TPOAb-positive euthyroid women.

Serum TSH may be suppressed in up to 30% of normal pregnant women, often requiring no intervention. Gestational thyrotoxicosis is usually mild and transient, and can be treated with supportive care and follow up. For symptomatic Graves’ disease (GD), PTU is the drug in the first trimester and methimazole for second & third trimesters. TSH & TT4 should be checked at 4 weeks in case of intolerance to ATD, thyroidectomy, and TT4/FT4 kept high- or just above-normal pregnancy range. In case of intolerance to ATD, thyroidectomy, best performed during the second trimester, is a good alternative. The use of radioiodine is contraindicated in pregnancy.

Postpartum thyroiditis (PPT) includes hyper- or hypothyroidism during the first year after delivery. Commonly, hyper- is followed by hypothyroidism, with a return to a euthyroid state all within a few months. Symptomatic treatment with beta blockers is sometimes necessary. Of note, ATD use is safe for breastfeeding infants. While TRAb is negative in PPT, TPOAb is often positive and women with positive TPOAb have a significantly high risk of recurrent PPT with subsequent pregnancies.
Pituitary lesions are relatively common in the general population. Patients can present with wide ranging signs and symptoms of tumor mass effects (headaches, visual loss and cranial nerve dysfunction), pituitary hormone alterations, or more commonly, an incidental finding on imaging studies. Thorough endocrinological evaluation requires assessing patients for the extent of tumor burden and pituitary hormone alterations that include clinical examination, endocrine testing which can be basal and/or dynamic testing, and brain imaging. Pre-operative work-up and treatment planning generally require a multi-disciplinary team approach involving the expertise of endocrinologists, neurosurgeons, neuro-ophthalmologists, neuro-radiologists, and/or radiation oncologists. Apart from prolactinomas where medical therapy is generally the first-line treatment, treatment of pituitary lesions can either be surgery (either transsphenoidal hypophysectomy or craniotomy), or simply just monitoring for tumor growth. Following surgery, additional pituitary hormonal alterations may occur, including impairment of anterior pituitary hormone secretion and abnormalities of AVP regulation. In the immediate postoperative period, careful attention must be directed toward the detection and prompt treatment of sodium and water imbalance, and ACTH deficiency. Short-term postoperative measurement of serum hormone levels will also help to determine if resection of a hypersecreting tumor has been successful, whereas long-term postoperative surveillance is important to detect for the delayed development of additional pituitary hormonal deficiencies, to commence and ensure optimal hormonal replacement, and to monitor for tumor recurrence.

Vitamin D has received increased attention due to the resurgence of vitamin D deficiency in global health issues. Vitamin D deficiency is reportedly widespread across the world. Still most countries are lacking data, with very limited information on infants, children and pregnant woman. The prevalence of vitamin D deficiency varies from 2-30% in adults and up to 60% of children. Vitamin D deficiency has been reported in all phases of life throughout the world, which makes this issue an important health concern.

Vitamin D, a fat soluble vitamin, is generated in human skin by ultraviolet light. Vitamin D may come from three potential sources: nutritional sources, UVB-dependent endogenous production and supplements. Sun exposure is responsible for 80% of requirements. However, vitamin D is present in only a few foods. Vitamin D exists in two main forms, vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol). Both of them are sources for vitamin D activity. The active form of vitamin D is 1,25-dihydroxyvitamin D, the circulating level of which is tightly regulated and acts through vitamin D receptor to mediate different actions on almost every tissue.

The classical role of vitamin D involves intestine, kidney and bone. In intestine, the principal action of 1,25(OH)2 D3 and the vitamin D receptor is intestinal calcium absorption. Meanwhile in the kidneys, 1,25(OH)2 D3 is responsible for the reabsorption of calcium at distal tubules and phosphate excretion but the molecular mechanism is still incompletely characterized. Vitamin D action control bone metabolism mainly indirectly by regulating mineral homeostasis, but the exact role of the vitamin D receptor
(VDR) in osteogenic cells for bone homeostasis during a normal calcium balance requires further investigation. Pleiotropic actions of vitamin D related to in vitro study showed antineoplastic activities of active form of vitamin D3. There are plausible pathways whereby VIT D deficiency can impair immune function, resulting in both overactivity and increased risk of autoimmune disease, as well as immune suppression with poorer resistance to infection. Chemotaxis and phagocytic capabilities of innate immune cells, transcription of antimicrobial peptides are enhanced by complex calcitriol, VDR and retinoid X receptor. Current studies have related vitamin D deficiency with several autoimmune disorders, including insulin dependent diabetes mellitus, multiple sclerosis, inflammatory bowel disease, systemic lupus erythematosus, rheumatoid arthritis, Hashimoto thyroiditis, Vitamin D and active metabolite, 1,25(OH)2D exert various actions through VDR that may be useful for the prevention or treatment of various cancers. Vitamin D and calcium are important in the mechanical and structural integrity of the skeleton. Vitamin D deficiency leads to an amplification of age-related bone turnover, bone loss and increased risk of fracture. In systematic review, the prevalence of vitamin D deficiency was higher in obese subjects compared to eutrophic group. In summary vitamin D is an important substance throughout human life and vitamin D deficiency has been implicated in some diseases.

**ME5**

**Comprehensive Geriatric Assessment in Elderly Diabetic Patients**

**Assoc Prof Thi Thanh Huyen Vu,**<sup>1</sup> **Huong TT Nguyen,**<sup>1</sup> **Thanh X Nguyen,**<sup>2</sup> **Tu A Le,**<sup>3</sup> **Tam N. Nguyen**<sup>1</sup>

<sup>1</sup>Department of Gerontology, Hà Nội Medical University,  
<sup>2</sup>Outpatient Department, National Geriatric Hospital,  
<sup>3</sup>Department of Endocrinology, Nghe An Endocrinology Hospital

**5A - Comprehensive Geriatric Assessment in Elderly Diabetic Patients,**  
10 November 2017, 3:30 PM - 4:15 PM

**5B - Comprehensive Geriatric Assessment in Elderly Diabetic Patients,**  
10 November 2017, 4:15 PM - 5:00 PM

**Objectives:** To identify geriatric conditions and their relationship to glycaemic control among elderly outpatients with diabetes.

**Methodology:** We conducted a cross-sectional study on 412 patients with diabetes aged ≥ 60 years from October 2015 - October 2016. Information on socio-demography, medical history, glycaemic control (fasting plasma glucose (FPG) and HbA1c) and ten characteristics of comprehensive geriatric assessment (CGA) such as polypharmacy, activity daily living (ADL), instrument activity daily living (IADL), cognitive impairment, depressive symptoms, nutritional status, fall risk, hearing loss, poor vision and urinary continence were assessed.

**Results:** The mean age of all subjects was 71.9 ± 7.63 years, ranging between 60 and 91 years. Among ten components of CGA, the highest and lowest proportion was poor vision (94.2%) and urinary incontinence (8.7%), respectively. The study population had rates of depressive symptoms (79.4%), polypharmacy (57.8%), declines in ADL and IADL (47.1% and 65% respectively), hearing loss (48.8%); and cognitive impairment (26.9%). Ten items of CGA in our study had relationship with low glycemic control (p<0.05). Impairment cognitive function (OR: 12.4, 95%CI: 6.2-24.7, p<0.01), depression (OR: 5.6, 95%CI: 3.7-8.7, p<0.01), declines in ADL (OR:3.0, 95%CI: 2-4.5, p<0.01), declines in IADL (OR:5.7, 95%CI: 3.7-8.9, p<0.01), poor vision (OR:7.4, 95%CI:2.5-22.2, p<0.01) were remarkable risk factors for failure to reach HbA1c target.

**Conclusion:** The prevalence of most components of CGA was high and these were the same significant risk factors of poor glycemic control among elderly patients with diabetes. A CGA should be applied in elderly patients with diabetes for early screening of functional impairment risk.
ME6
Euthyroidism - An Elusive Target and its Pitfalls

Assoc Prof Melvin Leow
National University of Singapore

6A - Euthyroidism - An Elusive Target and its Pitfalls, 10 November 2017, 3:30 PM - 4:15 PM
6B - Euthyroidism - An Elusive Target and its Pitfalls, 10 November 2017, 4:15 PM - 5:00 PM

It has been assumed that as long as the circulating thyrotropin (TSH) and free thyroxine (FT4) levels of thyroid patients are controlled within the normal population ranges of these hormones, euthyroidism will be achieved and that should lead to an optimal state of health. Yet, it is commonly observed in clinical medicine that many patients persistently experience suboptimal health and poorer quality of life compared to their pre-morbid status despite their biochemically euthyroid status. Such symptomatic ‘euthyroidism’ suggests that narrower intra-individual physiological ranges are crucial and supports the existence of a unique homeostatic set point. While this concept is valid, the elucidation of the hypothalamus-pituitary-thyroid (HPT) axis set point in practice proved elusive despite great strides in thyroid research. Mathematical modeling has succeeded to a degree in pinning down this set point. This talk highlights a maximum curvature theory that sheds novel insights on the homeostasis of the HPT axis. Preliminary evidence suggests that targeting treatment toward a set point can yield better health and mitigate pathophysiological processes associated with “euthyroid thyroid function test results” which are distant from the set point. This novel model of the HPT axis forms the basis for personalized thyroid hormone targets in this present age of precision medicine.

ME7
Glucocorticoid and Mineralocorticoid Replacement and Supra Physiologic Use

Dr Lynnette Nieman
National Institutes of Health Program in Reproductive and Adult Endocrinology, Eunice Kennedy Shriver National Institute of Child Health and Human Development
President of the Endocrine Society

7A - Glucocorticoid and Mineralocorticoid Replacement and Supra Physiologic Use, Room 7, 11 November 2017, 3:30 PM - 4:15 PM

Lifelong glucocorticoid and mineralocorticoid replacement therapy is necessary after bilateral adrenalectomy or with primary adrenal insufficiency (AI). Because aldosterone production is not greatly affected by ACTH deficiency, mineralocorticoid replacement is unnecessary in secondary AI. The choice and dose of glucocorticoid depends on the patient and drug availability. We favor hydrocortisone because (compared to longer acting preparations) it allows fine dose titration and better mimics the normal cortisol rhythm. Based on cortisol production rates, we initiate treatment at 10-12 mg/M2/d, most given immediately on awakening and the rest in the afternoon. Others give a third, smaller, evening dose; this can be helpful in patients with profound evening fatigue. The mineralocorticoid fludrocortisone is generally initiated at a dose of 100 mcg/d. Glucocorticoids are titrated based on clinical symptoms (Cushingoid features); mineralocorticoid titration targets normal potassium/renin levels. Supraphysiologic glucocorticoid doses are used to treat non-endocrine disorders, usually for immunosuppression. In these settings the dose is titrated based on the response of the underlying medical problem. When they are no longer needed the patient can be tapered off the medications. Tapering begins with frequent dose decreases until a replacement dose is reached. If the underlying disease flares, the dose is increased. Once on a replacement dose, the HPA axis begins to recover from suppression induced by the supraphysiologic dose. As recovery can take 6 – 12 month, tapering is slow, based on morning cortisol and ACTH levels, followed by ACTH stimulation testing when cortisol levels are greater than 10-12mcg/dL.
ME8
Diabetes Education
Assoc Prof Graham McMahon
Brigham and Women’s Hospital, USA

8A - Diabetes Education,
11 November 2017, 3:30 PM - 4:15 PM
8B - Diabetes Education,
11 November 2017, 4:15 PM - 5:00 PM

Diabetes self-management education (DSME) is associated with improved diabetes knowledge and self-care behaviors, lower A1C, lower self-reported weight, improved quality of life, healthy coping, and reduced health care costs. DSME focuses on supporting patient empowerment by providing people with diabetes the tools to make informed self-management decisions, and has transitioned over time to being more patient centered and collaborative. Treatment goals and plans should be created with the patients based on their individual preferences, values, and goals. Treatment plans are most effective when they align with the Chronic Care Model, emphasizing productive interactions between a proactive practice team and an informed activated patient. The goal of provider-patient communication is to establish a collaborative relationship and to assess and address self-management barriers without blame. DSME standards call for an integrated approach that includes clinical content and skills, behavioral strategies (goal setting, problem solving), and engagement with psychosocial concerns. DSME should address healthy lifestyle choices, self-management, prevention of complications, and how to self-modulate behavior. DSME is increasingly facilitated by more sophisticated educational technology (including mobile technology), and endures through targeted educational approaches based on identified needs. This session will review best practices in the provision of effective DSME, including a review of strategies to become culturally-sensitive patient-centered, and effectively improve patient engagement, consolidation of learning, team formation, and introduce educational and communications technology to an endocrine practice.

ME9
The Management of Non-Functional Pituitary Adenomas
Prof Ken Ho
Princess Alexandra Hospital, University of Queensland, Australia

9A - The Management of Non-Functional Pituitary Adenomas,
11 November 2017, 3:30 PM - 4:15 PM
9B - The Management of Non-Functional Pituitary Adenomas,
11 November 2017, 4:15 PM - 5:00 PM

Non-functioning adenomas (NFAs) are the most common pituitary neoplasms. They are usually diagnosed from local compression symptoms or incidentally from imaging undertaken for investigations of other conditions. The prevalence of pituitary adenomas is about 10% and that of macroadenomas about 0.2% and among macroadenomas, about 80% are non-functioning.

NF microadenomas have a benign growth history, rarely cause secondary pituitary dysfunction and should be managed conservatively with imaging at infrequent intervals. For macroadenomas, 50% enlarge over 5 years. Spontaneous regression occurs in about 10%.

Surgery is the most effective treatment for NFAs. NFAs rarely respond to drug therapy with dopamine agonists or somatostatin analogs. Post-operative radiotherapy reduces the rate of tumour recurrence and is advocated for patients with incomplete removal and significant tumour remnant. Follow up management entails replacement of pituitary hormone deficits and surveillance for tumour recurrence. In surgically-resected NFAs further treatment for recurrence is dependent on the presence of residual tumour, growth rate and location. Postoperative growth rate of NFAs in the early years of imaging can be used to tailor long-term follow-up to optimize use of health resources.
ME10
The Controversies of Late-onset Hypogonadism

Dr Kyaw Kyaw Soe
University of Texas Southwestern Medical Center, Dallas, USA

10A - The Controversies of Late-onset Hypogonadism,
11 November 2017, 3:30 PM - 4:15 PM
10B - The Controversies of Late-onset Hypogonadism,
11 November 2017, 4:15 PM - 5:00 PM

There is a rising trend for diagnosis of late-onset hypogonadism and testosterone prescription in the United States of America. More and more middle-aged men are requesting and getting tested for low testosterone. It is still debatable about evidence-based testosterone threshold level for testosterone replacement in late-onset hypogonadism.

Concerns about cardiovascular safety of testosterone replacement therapy in men deprive the necessary testosterone therapy for patients who will have more benefit than risk. Testosterone trial by Peter Synder et al answered some of questions regarding testosterone replacement therapy but the most important question; cardiovascular safety of testosterone therapy remained unanswered.

In this lecture, the speaker will discuss the controversies and challenges of diagnosis of late onset hypogonadism.
**DAY 1**

**A1**

**Browning Effect of Differentiating 3T3-L1 Preadipocytes by Osteopontin**

Mr Jeongkun Lee, Mr Yeong Hun Lee, Ms Chae Lim Park, Prof Chi Hyun Kim  
Yonsei University, South Korea

**AFES Investigator Award,**  
10 November 2017, 2:15 PM - 3:15 PM

**Objective:** Obesity is a worldwide metabolic disease that is induced by excessive energy consumption and accumulation of white adipocytes. On the other hand, brown adipocytes can expend energy to suppress obesity. In this study, we investigated whether osteopontin (OPN), a cytokine secreted primarily from bones known for triggering adipose tissue remodeling, induces browning on differentiating 3T3-L1 preadipocytes.

**Methodology:** 3T3-L1 preadipocytes were differentiated for 5 days and treated with OPN (0M, 1nM, 10nM, and 100nM) for either 2 hours or 2 days. After each treatment, lipid accumulation was measured by Oil Red O staining. At day 7, cells were harvested and lysed in RIPA buffer. Western blot analysis was conducted for the assessment of UCP1, PGC-1 alpha, PRDM16, PPAR gamma, C/EBP beta, and p-ERK proteins. GAPDH was used as a control.

**Results:** OPN treatment significantly decreased the size of lipid droplets, especially in the 2-hour group. OPN treatment increased UCP-1, PGC-1 alpha, PRDM16, and p-ERK expressions compared to control. Cells treated with 10nM appeared to be the most responsive. There were no significant changes in the expressions of PPAR gamma or C/EBP beta.

**Conclusion:** OPN induced activation of brown adipogenesis marker proteins from white adipocytes. Normal physiological levels of osteopontin promoted the maturation of preadipocytes into brown adipocytes. These results indicate that physical exercise may help treat obesity by turning white adipocytes into brown adipocytes by osteopontin.
**A3**

Serum Creatinine Variability as a Novel Biomarker Predictive of Albuminuria Progression in Type 2 Diabetes Mellitus – Discovery and Validation in Two Longitudinal Cohorts

Dr Kiat Mun Serena Low, Assoc Prof Su Chi Lim, Dr Xiao Zhang, Dr Keven Ang, Assoc Prof Tavintharan Subramaniam, Assoc Prof Chee Fang Sum

Khoo Teck Puat Hospital, Singapore

AFES Investigator Award,
10 November 2017, 2:15 PM - 3:15 PM

**Objective(s):** The role of stability of renal function on kidney disease progression is unknown. We examined association between serum creatinine (scr) variability and albuminuria progression in Type 2 Diabetes (T2DM) and elucidated mechanism for the association.

**Methodology:** In a discovery cohort, we identified 589 T2DM patients attending Diabetes Centre with ≥6 scr readings and no macroalbuminuria at baseline in 2002-2014. Scr variability was expressed adjusted-Cr-standard-deviation(CrSD)=SD/√[n/(n-1)]. We used cox-proportional hazards regression for outcome on progression (worsening across albuminuria stages), adjusting for demographics, medication, blood pressure, urinary-albumin-to-creatinine ratio (uACR), estimated glomerular filtration rate (eGFR), glycated haemoglobin(HbA1c) and cr-intrapersonal-mean (CRMEAN). We validated the association in a prospective cohort comprising 554 T2DM patients attending Diabetes Centre in 2011-2016. The Homeostatic model assessment (HOMA2)-Insulin Resistance (IR) index was obtained from HOMA Calculator. Sobel-Goodman mediation test was performed to examine extent of mediation between IR (defined by HOMA2-IR>1.8) and progression by adjusted-CrSD.

**Results:** Progression occurred in 31.2% of patients in discovery cohort. The progressors had higher median adjusted-CrSD than non-progressors [9.62(5.90-16.93) vs. 6.94(4.64-10.57); p<0.001]. Log-transformed adjusted-CrSD was significantly associated with progression (adjusted HR 1.46(1.06-2.01); p=0.021). Log-transformed adjusted-CrSD was significantly associated with progression (adjusted OR 1.51 (1.09-2.09); p=0.013). CrMEAN was not associated with progression in both cohorts. Adjusted-CrSD accounted for 26% of association between IR and progression after adjustment in mediation test in validation cohort (p=0.015).

**Conclusion:** Higher scr variability predicted albuminuria progression, independently of intrapersonal mean. It is a potential mediator of association between IR and ACR progression.

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**A4**

Next Generation Sequencing-based Discovery of Novel Genetic Markers in the Vitamin D Receptor Gene correlated with Osteoporotic Fracture among Older Filipino Women

Mr Mark Pretzel Zumara, Dr Paul Julius Medina, Mr Juan Miguel Recto, Dr Edelyn Azurin, Dr Celeste Tanchoco, Dr Cecilia Jimeno, Dr Cynthia Saloma

1Food and Nutrition Research Institute, 2Philippine Genome Center, 3National Institute of Molecular Biology and Biotechnology, 4Philippine Orthopedic Center, 5Mindanao State University – College of Medicine, 6University of the Philippines College of Medicine

AFES Investigator Award,
10 November 2017, 2:15 PM - 3:15 PM

**Objectives:** This study aimed to discover novel genetic variants in the entire 101 kb vitamin D receptor (VDR) gene for osteoporotic fractures in a group of older Filipino women using next generation sequencing approach in a case-control study design.

**Methodology:** A total of fifty women with and without osteoporotic fracture seen at the Philippine Orthopedic Center were included. Blood samples were collected for determination of serum vitamin D, calcium, phosphorus, glucose, blood urea nitrogen, creatinine, aspartate aminotransferase, alanine aminotransferase and as primary source for targeted VDR gene sequencing using the Ion Torrent Personal Genome Machine. The variant calling was based on the GATK best practice workflow and annotated using Annovar tool.

**Results:** A total of 1496 unique variants in the whole 101-kb VDR gene were identified. Novel sequence variations not registered in the dbSNP database were found among cases and controls at a rate of 23.1% and 16.6% of total discovered variants, respectively. Noteworthy is the discovery of two disease-associated novel heterozygous frameshift deletions (Pearson chi square p-value. Neither of the two SNPs was found in control patients nor in the dbSNP. Furthermore, two novel exonic variants were predicted to be damaging and may have increased the probability of acquiring osteoporotic fracture.

**Conclusion:** These findings show the power of Next Generation Sequencing in identifying sequence variations in a very large gene and the surprising results obtained in this study greatly expand the catalog of known VDR sequence variants that may represent an important clue in inter-individual response to vitamin D treatment for osteoporotic fracture.
OBJECTIVE: To assess nutritional status and some factors related to malnutrition among elderly outpatients with diabetes.

METHOD: Cross-sectional study of 158 elderly diabetic subjects in the outpatient clinic aged 60 or over coming to National Geriatric Hospital from June 15th to September 29th. Mini-Nutritional Assessment – short form (MNA-SF) and Fried Frail Criteria were used to assess nutritional status and frailty syndrome, respectively. Chi-squared test and logistic regression model were used to assess the associations between some factors with nutritional status.

RESULTS: 52 in 158 patients were malnourished or were at risk of malnutrition (32.9%). Nutritional status of elderly patients with diabetes was statistically significantly associated with over 4.5 kg weight loss, exhaustion, cognitive impairment, functional independence (p <0.05). Weight loss, exhaustion, cognitive impairment and slowness increase the preponderance to fall under the categories of at risk of malnutrition, and malnutrition with odds ratios of 11.82 (95% CI: 2.69-51.90), 2.99 (95% CI: 1.13-7.91); 4.09 (95% CI: 1.66-10.09); 3.44 (95% CI: 1.44-8.20), respectively.

CONCLUSIONS: The prevalence of malnutrition or at risk of malnutrition status was high among elderly outpatients with diabetes. Risk of malnutrition/malnutrition are increased in elderly patients with diabetes with weight loss, exhaustion, cognitive impairment and slowness.
Oral Presentations

O3

The Prevalence of Proteinuria among Adults with Impaired Fasting Glucose in Manila Doctors Hospital

Dr Katrina Marie Villamiel, Dr Sweet Garllie Albert Tappan, Dr Myrna Buenaluz-Sedurante, Dr Ma. Cristina Roldan, Dr Elizabeth Montemayor
1The Medical City, Pasig City, Philippines, 2Manila Doctors Hospital, Manila City, Philippines, 3Philippine General Hospital, Manila, Philippines, 4St. Luke’s Medical Center, Quezon City, Philippines

Free Paper 1, Room 7, 10 November 2017, 2:15 PM - 3:15 PM

Objective: To determine the prevalence of proteinuria among adult patients with impaired fasting glucose (IFG) and normal fasting glucose (NFG).

Methodology: A cross sectional study of 117 adult patients without diabetes with no overt kidney disease were enrolled from the outpatient department of Manila Doctors Hospital from July 2015 to December 2015. Fasting blood glucose, serum creatinine, routine urinalysis and dipstick micral test (using ROCHE ChemStrip Micral) were done. The prevalence of proteinuria among patients with IFG was compared to those with normal fasting glucose (NFG). Multiple regression analysis was done to determine factors associated with presence of proteinuria.

Results: The prevalence of proteinuria was 32.48% (95% CI [24.96-42.26] n=117) in the total sample, 31.46% (95% CI [22.79-42.42] n=89) in patients with normal fasting glucose (NFG), and 35.71% (95% CI [20.33-57.55], n=26) in patients with impaired fasting glucose (IFG). Patients with IFG were 1.21 times more likely to have proteinuria than patients with NFG, however this was not statistically significant (p=0.675, 95% CI [0.495-2.957]). Factors associated with presence of proteinuria were: history of hypertension (OR=2.783, p=0.020), systolic BP (OR=1.022, p=0.023), high pulse pressure (OR = 1.030, p=0.038), history of antihypertensive medication use (OR=4.191 p=0.007). Multivariate analysis revealed that use of antihypertensive medications, particularly calcium channel blockers, was independently associated with presence of proteinuria.

Conclusion: Patients with impaired fasting glucose were not more likely to have proteinuria than those with normal fasting glucose. Hypertension is a significant factor associated with proteinuria in patients without diabetes and without overt kidney disease.

O4

Microvascular Function is an Independent Predictor for Albuminuria Progression among Asians with Type 2 Diabetes - A Prospective Cohort Study

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Free Paper 1, Room 7, 10 November 2017, 2:15 PM - 3:15 PM

Objective. Microvascular endothelial dysfunction has been associated with albuminuria in cross-sectional studies. We aim to investigate whether it is an independent predictor for future albuminuria progression in in type 2 diabetes (T2DM) cohort in Singapore.

Methodology. In a prospective cohort, 1,106 T2DM patients were clinically assessed at baseline and after a median follow-up of 3.2 years. Patients were divided into progression and non-progression according to changes of urinary-albumin-to-creatinine ratio (ACR). Progression was defined as transition from normo- (ACR<30mg/g) to microalbuminuria (ACR=30-299mg/g) or macroalbuminuria (ACR>300mg/g), or micro- to macroalbuminuria. Microvascular endothelial vasodilation at baseline was quantified using 2-dimensional laser Doppler flowmetry. The increase in perfusion in response to acetylcholine (Ach, endothelium-dependent vasodilation) and sodium nitroprusside (NaNP, endothelium-independent vasodilatation) was calculated. Logistic regression model was used to estimate the odds ratio (OR) for albuminuria progression.

Results. Albuminuria progression occurred in 232 (21.0%) patients. The median baseline Ach was significantly higher in non-progression (72.5 [40.9-108.7]%) than progression group (59.9 [36.1-99.6]%, p=0.033). There is no significant difference in NaNP between the two groups (109.9 [50.4-181.2]% vs. 97.0 [42.9-167.8]%, p=0.203). After multivariable-adjustment, one-unit increase in natural logarithm (ln) Ach was not associated with progression (OR=0.768, [95%CI, 0.534-1.106], p=0.156) in all patients. When stratified by baseline albuminuria, one-unit increase in lnAch was associated with progression in normoalbuminuria (OR=0.581, [0.347-0.972], p=0.039, n=874), but not in microalbuminuria patients (OR=1.113, [0.520-2.384], p=0.782, n=370).

Conclusion. Impaired endothelial dependent microvascular reactivity predicts albuminuria progression in normoalbuminuria patients, suggesting that it may drive the onset of albuminuria in T2DM.
O5
Hypoglycemic Detection with Continuous Glucose Monitoring is more effective than frequent Capillary Blood Glucometer in Patients with Diabetes

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Free Paper 1, Room 7,
10 November 2017, 2:15 PM - 3:15 PM

Objective: To compare the effectiveness of continuous glucose monitoring (CGM) and self-monitored blood glucose (SMBG) on detection of hypoglycemic episodes.

Methodology: We studied patients with diabetes treated with insulin or oral agents who were monitored for 6 consecutive days using both CGM and SMBG.

Results: 43 patients were 46 ± 17 years old with an HbA1c of 8.15 ± 1.98% each monitored for an average of 144 hours. In this group, 32/43 (74.4%) had hypoglycemic episodes with an average of 0.77 ± 0.53 episodes/day; of those events, 21.3% were severe and 31.5% occurred at night. SMBG revealed that 44.2% of the patients had experienced hypoglycemia, meanwhile CGM found hypoglycemia in 74.4% of patients. CGM detected significantly higher percentages of hypoglycemic episodes than capillary blood glucose measurements with 144 events vs 40 events, in which severe episodes were 31 and 6, respectively. 41.8% of patients experienced asymptomatic hypoglycemic episodes and 27.9% experienced nocturnal hypoglycemic events recorded by CGM but had no data in capillary blood glucose diary.

Conclusions: In patients with diabetes, CGM showed higher number of hypoglycemic events than did SMBG, especially asymptomatic and nocturnal events. CGM is a useful tool which detects hypoglycemic events significantly effectively and provides valuable information for clinical doctors.

O6
Secondary Oral Hypoglycemic Agent (OHA) Failure in Type 2 Diabetes Patients Infected with Hepatitis C Virus

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Free Paper 2,
10 November 2017, 2:15 PM - 3:15 PM

Objective: Chronic hepatitis C infection affects glycemic control by various pathophysiological mechanisms in patients with diabetes mellitus. This study was to evaluate the prevalence of secondary OHA failure in hepatitis C (HCV) diabetes patients compared with hepatitis B (HBV) and both hepatitis B and C negative [B, C(-)] diabetes patients.

Methodology: Patients requiring insulin therapy regardless of HbA1c and those who had HbA1c >7% in spite of having maximum dosage (75%) of 3 OHAs (Metformin, Sulphonylurea, and Thiazolidinediones) were considered as secondary OHA failure. This is a prospective study conducted on 1303 T2DM patients and their Hepatitis B and C status was checked by ELISA method. Glycemic control was done according to standard guidelines or with a personalized approach and reviewed at 6-months. Patients with HBV and HCV coinfection (n=10) were excluded. This study was observed in three groups, HCV(+) or HBV(+) or non-infected [B, C(-)] diabetes patients.

Results: Out of 1293 cohorts including 152 HCV(+), 111 HBV(+) and 1030 B, C(-) individuals with diabetes, a total of 270 (20.7%) had secondary OHA failure. Regarding the proportion of respective study population, HCV group was statistically significant in requiring insulin therapy and not achieving glycemic control with maximum OHA, compared with the remaining groups [42.1% in HCV (+) ve vs 27.02 % in HBV (+)ve and 17.1% in B,C(-) individuals with diabetes].

Conclusion: Secondary OHA failure and requirement of insulin therapy for glycemic control is significantly more in HCV infected diabetes patients. Therefore, for strict glycemic control, early intensification with insulin therapy is important in such patients.
O7

Association of Adverse Pregnancy Outcomes with Glycemic Cut-offs Stated by the IADPSG, POGS and WHO Diagnostic Criteria for Gestational Diabetes Mellitus in De La Salle University Medical Center (DLSUMC), Cavite, Philippines from January 2012 - December 2015

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Free Paper 2,
10 November 2017, 2:15 PM - 3:15 PM

Objectives: To determine the association between adverse pregnancy outcomes with each of the 75g OGTT cut-off values prescribed by the World Health Organization (WHO), Philippine Obstetrical and Gynecological Society (POGS), and the International Association of Diabetes in Pregnancy Study group (IADPSG) criteria to help define more appropriate glycemic cut-off levels for Filipinas.

Methodology: Retrospective cohort study of pregnancy deliveries in De La Salle University Medical Center (DLSUMC), Cavite, Philippines from January 2012 to December 2015. Subjects were >18 years old with a singleton pregnancy, a 75 g OGTT result, and complete medical record without other existing comorbidities or illnesses that may affect outcomes. Maternal and neonatal outcomes were recorded and their association with the different glycemic cut-offs stated by the WHO, POGS and IADPSG were analyzed.

Results: Total of 195 subjects were included. Patients with an FBS ≥126 mg/dL were 5.7 fold more likely to have pre-eclampsia (p = 0.020) and 3.2 fold likely to have preterm delivery (p=0.44), however, there is a significant number of GDM patients (22.3%) not diagnosed by this higher FBS cut-off. Maternal outcomes showed 2.9 fold increased risk for preterm delivery with the 1-hour OGTT of ≥180 mg/dL (p = 0.021) and 6.7 times likely to have gestational hypertension with the 2-hour OGTT of ≥140 mg/dL (p = 0.011).

Conclusion: It is recommended to utilize the IADPSG criteria, but the usage of 2-hr OGTT of ≥140 mg/dL instead of ≥153 mg/dL showed added advantage for the Filipino population in terms of detecting risk for gestational hypertension.

O8

Glycemic Control among Ambulatory Patients with Type 2 Diabetes Mellitus on Insulin Therapy in a Tertiary Hospital

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Free Paper 2,
10 November 2017, 2:15 PM - 3:15 PM

Objectives: To determine the prevalence of poor glycemic control among ambulatory type 2 diabetes mellitus (DM) patients on insulin, to describe their clinical profile and to evaluate the correlations between insulin dose, diabetes duration, adverse effects, glycemic control and treatment satisfaction based on the Insulin Treatment Satisfaction Questionnaire (ITSQ) score.

Methodology: This is a one-year cross-sectional study using consecutive sampling technique conducted at the endocrinologist clinics in a tertiary hospital in the Philippines. Chi-square test was used for categorical data, two-sample independent t-test for continuous data, Pearson’s correlation coefficient (r) for correlation, and logistic regression for prediction of outcome. Computations with Epi Info™ v7.1.4.0.

Results: Among 111 patients, 74.55% had poor glycemic control, 42.34% experienced hypoglycemia episodes and 46.85% gained weight since their last visit. Mean ITSQ score was 77.5. Mean frequency of hypoglycemic episodes was 1.9, and mean body weight change was +0.15 kg. The frequency of daily insulin injections and the dosage of insulin correlated significantly with the frequency of hypoglycemia (r= 0.266, p= 0.004 and r= 0.33, p= 0.0004, respectively). Increased frequency of hypoglycemic episodes was associated with lower treatment satisfaction (r=-0.241, p=0.01). The frequency of daily insulin injections and ITSQ score were significantly correlated with good glycemic control (OR=1.933, p=0.015 and OR=1.044, p=0.032, respectively).

Conclusion: The prevalence of poor glycemic control among ambulatory type 2 DM patients on insulin in our institution remains high at 74.55%. Treatment satisfaction and frequency of daily insulin injections correlated significantly with good glycemic control.
**O9**

**Patient Decision Aids on Treatment Choice for Diabetes Mellitus: A Systematic Review and Meta-Analysis**

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**Free Paper 2,**  
10 November 2017, 2:15 PM - 3:15 PM

**Objective:** To determine whether patient decision aids (PDA) for type 2 diabetes mellitus (T2DM) treatment are effective in improving patient knowledge, participation in shared-decision making, and glycemic control and reducing decisional conflict

**Methodology:** We searched MEDLINE, CENTRAL, Embase, Clinicaltrials.gov, and grey literature until June 2017. We included RCTs that compared the use of a PDA versus usual care among adult T2DM patients. Two authors independently abstracted data, assessed studies for risk of bias, and calculated pooled estimates of treatment effects.

**Results:** Out of 2,635 articles during the initial search, 8 studies with 916 patients were included. All were of high risk for performance bias due to the lack of blinding because of the nature of the intervention. Three of the 8 studies used the Diabetes Medication Choice Aid, while the others used various PDAs in printed and computer-based formats. There was a significant reduction in overall decisional conflict score (mean difference -6.39, 95% CI -8.61, -4.16) and all its subscales. In contrast, there were no differences in glycated hemoglobin (HBA1C) at 6 months (mean difference 0.6%-0.13, 0.25), and change in HBA1C at 3 months (mean difference 0.11% [95% CI -0.06, 0.28]). There was only one study that reported on degree of patient involvement which also did not show any significant difference. There was a wide variety of scoring methods for knowledge in all the studies.

**Conclusion:** PDAs for treatment choices for T2DM reduced decisional conflict but had no effect on glycemic control and degree of patient involvement in decision making

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**O10**

**Study of Knee Osteoarthritis in Type 2 Diabetes Patients and its Impact on Quality of Life**

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**Free Paper 2,**  
10 November 2017, 2:15 PM - 3:15 PM

**Objectives:**
1. To find out the proportion of knee osteoarthritis in patients with type 2 diabetes mellitus
2. To compare the quality of life between Diabetes patients with OA and Diabetes patients without OA

**Methodology:**
This study was a hospital-based cross sectional descriptive study. A total of 273 Type 2 diabetes mellitus patients were selected. American College of Rheumatology (ACR) criteria was used for patient with knee pain after exclusion of inflammatory arthritis. Knee X- rays were performed to whom ACR criteria were met. Quality of life was assessed using Myanmar Quality of Life assessment questionnaire form (M-Qol) in diabetes patients with OA as well as in diabetes patients without OA (age and sex matched control).

**Results:**
The proportion of OA in diabetes population is 8%. There were 1 male patient and female 20 patients (95.2%). OA was most common in 51-60 year age group (42.9%) and 52.4 % were overweight. 52.4% had duration of diabetes >1 to 5 year. 76.2% were in Grade 3 Kellgren-Lawrence scale (X ray Grading). Mean value of M-Qol score of the case group was 0.86 ± 0.58 and that of control group was 0.2 ± 0.48 (p value 0.000).

**Conclusion:** Not all glycemic-controlled diabetes patients have best quality of life. This study showed that diabetes with OA have negative impact on quality of life especially on physical function and slightly also on mental health. Main concern in OA is not the mortality, but the disability and so, measurement of quality of life is worthy.
Incidence of Hypothyroidism and related factors among Type 2 Diabetic (T2D) Outpatients

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Free Paper 3, 10 November 2017, 2:15 PM - 3:15 PM

Objectives: To assess the incidence rate of hypothyroidism and related factors in T2DM patients.

Methodology: Retrospective cohort study. From 2000 to 2005, medical records of 997 T2DM patients (79.6% women) in a referral clinic were collected. Hypothyroidism was defined by TSH level >5 mIU/L. Blood pressure was measured at each visit, BMI, TSH, lipid profile, serum creatinine, urine albumin/creatinine ratio were assessed at least every year, HbA1c every 3-6 months. All patients were followed until 2016, or until loss of follow up.

Results: There were 102 cases of hypothyroidism, among these 25 had permanent and 78 transient hypothyroidism. The total follow up year was 9281.75 p-y. The incidence rate of permanent hypothyroidism was 1.83/1000 p-y. The relative risk of hypothyroidism in men was 0.55 (p=0.044).

At enrollment, mean age of all patients was 56.1 ± 11.5 yrs (mean ± sd), BMI 24.5± 6.4 kg/m², 43.65% of patients had high blood pressure.

There were no significant differences between the hypothyroid and non-hypothyroid group in terms of age, BMI, duration of diabetes, HbA1c levels, urine albumin/creatinine ratio, estimated glomerular filtration rate, lipid profile.

Conclusion: The incidence rate of permanent hypothyroidism based on TSH level in T2DM patients is not high. This disorder tends to be higher in women. Screening for hypothyroidism in patients with T2DM should be based on age (as in people without diabetes) rather than on the diabetic state.

Prognostic Factors in patients Hospitalised with Diabetic Ketoacidosis

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Free Paper 3, 10 November 2017, 2:15 PM - 3:15 PM

Background: Diabetic ketoacidosis is characterized by biochemical triad of hyperglycemia, acidosis, and ketonemia. It remains a life threatening condition despite improvement in diabetic care, timely identification and intervention remains the backbone of treatment.

Objectives: 1. To evaluate the clinical and biochemical prognostic markers in diabetic ketoacidosis. 2. To correlate the various prognostic markers with mortality in diabetic ketoacidosis.

Settings and Design: A prospective multicenteric observational study done at tertiary care center.

Methodology: Eighty-seven patients of type 1 diabetes hospitalized with diabetic ketoacidosis over a period of 1 year were evaluated clinically and by laboratory tests. Serial assays of serum electrolytes, glucose and blood pH, and clinical outcome of either discharge home or death were evaluated.

Statistical Analysis: Data were analyzed by SPSS version 17 and were presented in the values of mean, median, and percentages.

Result: The significant predictors of final outcome obtained were further regressed together and subjected with multivariate logistic regression (MLR) analysis. The MLR analysis further revealed that the male sex had 7.93 fold higher favorable outcome as compared to female sex (OR=7.93, 95% CI=3.99-13.51) while decrease in mean APACHE II score (14.83) and S. PO3-- (4.38) at presentation may lead 2.86 (OR=2.86, 95% CI=1.72-7.03) and 2.71 (OR=2.71, 95% CI=1.51-6.99) fold better favourable outcome respectively as compared to higher levels (APACHE II score: 25.00; S. PO3--: 6.04).

Conclusions: Sex, baseline biochemical parameters like APACHE II Score, and phosphate level, were important predictors of mortality from DKA.
O13
Incidence of Adrenal Insufficiency and its relation to Mortality in Patients with Septic Shock

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Free Paper 3,
10 November 2017, 2:15 PM - 3:15 PM

Background: The hypothalamic pituitary adrenal axis has a pivotal role in combating acute insults. Glucocorticoids play a role directly or indirectly in the maintenance of normal vascular tone and in potentiating the vasoconstrictor action of catecholamine, associated with septic shock.

Objective: To determine the incidence of adrenal insufficiency and its relation to mortality in patients with septic shock.

Settings and Design: A prospective observational study done at tertiary care center.

Methodology: In patients of septic shock, APACHE II score was calculated and serum cortisol was measured at the time of admission and 1 hour after giving 250 μg ACTH. Hydrocortisone was added to inotropics in all patients after drawing 2nd blood sample for serum cortisol and was continued till 7 days or less.

Results: The incidence of adrenal insufficiency (AI) in septic shock was (N=100) was 42% (in absolute 14%, relative 28%). The incidence of AI in septic shock was 42% (absolute 14%, relative 28%). The mortality rate was 48%, and it was higher in patients with AI than in patients without AI (P = 0.017).

Conclusions: AI is prevalent among patients with septic shock. We found that higher APACHE scores were associated with higher rates of adrenal failure and mortality in patients with septic shock. There also appears to be a bimodal distribution of mortality with adrenal status in patients with septic shock.

O14
Development of Scoring System for Risk Stratification of Hypothyroidism in Type 2 Diabetes Mellitus Patients in Indonesia

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Free Paper 3,
10 November 2017, 2:15 PM - 3:15 PM

Objective: Development of scoring system for risk stratification of thyroid dysfunction in type 2 is needed to screen patients who need to undergo thyroid function test. The aim of this study was to identify risks of having hypothyroidism in type 2 diabetes mellitus patients in tertiary hospital in Indonesia.

Methodology: This was a cross-sectional study conducted in Endocrinology and Diabetes Outpatient Clinic Cipto Mangunkusumo Hospital from July-September 2015. All subjects underwent history taking, physical examination, and laboratory testing (TSH and fT4). Analysis was done by using SPSS Statistics 17.0 for multivariate and ROC analysis and SPSS Statistics 20.0 for Hosmer-Lemeshow Calibration.

Results: 303 subjects included in the study. 23 subjects (7.59%) are diagnosed as having hypothyroidism, consisted of 10 subjects (43.5%) clinical hypothyroidism and 13 subjects (56.5%) subclinical hypothyroidism based on Zulewski – Billewicz Clinical Index, and 8 subjects (34.8%) subjects as having clinical hypothyroidism and 15 subjects (65.2%) subjects as having subclinical hypothyroidism based on fT4 examination. Determinants for hypothyroidism in T2DM patients are family history of thyroid disease with OR 4.7 (95% CI 1.07-20.8, p = 0.04), having goiter with OR 20.7 (95% CI 3.49-122,66, p=0.001), poor glycemic control with OR 3.5 (95% CI 1.08-11.14, p=0.037), and metabolic syndrome with OR 25.7 (95% CI 2.2-299,99, p=0.01).

Conclusion: Prevalence of hypothyroidism in T2DM patients is 7.59%. Determinants and components of scoring system of hypothyroidism in T2DM patients consist of family history of thyroid disease, having goiter, poor glycemic control, and metabolic syndrome.
Is Japanese Thyroid Association (JTA) Thyroid Storm Score or Burch Wartofsky Scale (BWS) Better in Predicting Clinical Outcomes in Hospitalized Thyrotoxicosis Patients?

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Free Paper 3,
10 November, 2017, 2:15 PM - 3:15 PM

Background: Thyroid storm (TS) is a life-threatening endocrine emergency. Diagnosis of thyroid storm remains challenging despite the aid of two diagnostic criteria.

Objectives: Our objectives were to compare the clinical outcomes of all hospitalized thyrotoxicosis patients using the Burch-Wartofsky scores (BWS) and Japanese Thyroid Association Thyroid Storm (JTATS) criteria.

Methodology: This was a non-interventional, retrospective and cross-sectional cohort study of 3-year period at two tertiary hospitals involving patients clinically diagnosed Thyroid storm (TS) and thyrotoxicosis non-storm (TNT).

Results: Twenty-six TS and 165 TNT patients were identified. The mean age of TS was 42.45±13.93 years old and comparable with the TNT group. Both groups were predominantly female (69.2% in TS, and 68.2% in TNT) and Malay ethnicity (73.1% in TS and 66.7% in TNT). TS was the first clinical presentation in 7 patients (26.9%). Patients of TS had higher frequency of atrial fibrillation, higher temperature, and pulse rate and lower Glasgow coma scale (GCS) score compared to TNT patients. TS patients had greater inpatient mortality, intensive care unit admissions, and ventilation requirements than TNT patients. The mortality rate in TS patients was 46.2%. Both BWS ≥45 and JTATS1 captured almost all TS patients. Among the TNT patients, BWS ≥45 had more adverse clinical outcomes compared with BWS 25-44 while there was no difference between JTATS1 and JTATS2. No independent factors predicting mortality though multiple factors were recognized.

Conclusions: Using either BWS or JTATS criteria was able to diagnose and manage TS appropriately. There is no difference in clinical outcomes between either criteria.

Lithium as an Adjuvant to Radioactive Iodine Therapy in Patients with Differentiated Thyroid Carcinoma: A Meta-Analysis

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Free Paper 4,
10 November, 2017, 2:15 PM - 3:15 PM

Objectives: To assess the effects of lithium as an adjuvant to RAI therapy for residual or metastatic differentiated thyroid carcinoma.

Methodology: We performed a systematic literature search in MEDLINE, EMBASE, The Cochrane Library and trial registries. We included randomized controlled trials (RCT) comparing RAI therapy with adjuvant lithium versus RAI therapy alone or in combination with either placebo or rhTSH in adults with differentiated thyroid carcinoma (DTC). The last date of search was June 9, 2017. Two review authors independently extracted data, assessed the risk of bias and evaluated overall study quality using GRADE. A random-effects model was used for pooling data.

Results: Out of the 587 potentially relevant articles on initial systematic search, we included two RCTs involving 86 adult post-thyroidectomy patients with low-risk DTC for initial RAI therapy. One study had unclear risk of bias in most of the domains. The second study had a good methodologic quality but included a small sample size. We found no statistically significant difference between the lithium and control groups in terms of successful ablation as indicated by a negative WBS after 1 year (OR 2.35; 95% CI 0.39 to 13.98). No deaths or serious adverse events were reported. No study examined all-cause and disease-specific mortality.

Conclusion: The pooled results suggest that adding lithium to RAI does not increase the rates of successful remnant ablation low-risk DTC patients. Larger RCTs with better methodologic quality are needed to establish the utility of lithium as an adjuvant to RAI among patients with DTC.
Pre-op TSH and Thyroiditis are Not Risk Factors for Hypothyroidism following Hemithyroidectomy in an Asian Cohort with High Incidence of Thyroiditis

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Free Paper 4,
10 November 2017, 2:15 PM - 3:15 PM

Objective: Studies have shown that higher pre-op TSH values and presence of thyroiditis as predictive factors for hypothyroidism. The aim was to assess the incidence of hypothyroidism and predictive factors for hypothyroidism following hemithyroidectomy in an area of high incidence of thyroiditis.

Methodology: Retrospective analysis of patients who underwent hemithyroidectomy from January 2000 to December 2013 at a tertiary institution. Patients were divided into two groups, into postop hypothyroid (n = 123) and euthyroid groups (n = 799). Factors analysed: age, gender, race, biochemical data (pre- and post-op TSH levels at 3, 6, 12, 24, 36, 60 and 120 months), histology and duration of follow-up. Multivariate analysis was performed to identify multiple risk factors of development of hypothyroidism.

Results: Incidence of hypothyroidism in the cohort was 15%, with presence of thyroiditis in 27%. Mean age of cohort was 49.66 (±16.17) with female: male ratio of 3:1. 89% of patients were symptomatic and required thyroxine replacement. There was no difference in pre-op TSH and the presence of thyroiditis in patients who were hypothyroid versus non-hypothyroid (TSH: 2.20 vs 2.21; p=NS) and (thyroiditis: 15% vs 18%; p=NS). There was no relationship between age, gender, race, histology and the subsequent risk of hypothyroidism. Mean follow-up was for 84 months and mean time to develop hypothyroidism was 18.2 ± 10.9 months.

Conclusions: Incidence of hypothyroidism following hemithyroidectomy was 15%. Pre-op TSH and presence of thyroiditis did not confer any risk towards the development of hypothyroidism. Therefore, routine evaluation of thyroid antibodies is unnecessary in patients undergoing hemithyroidectomy.

Real World Clinical Data of Sorafenib for Treatment of Progressive Radioiodine Refractory Differentiated Thyroid Carcinoma: Korean Multicenter Study

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Free Paper 4,
10 November 2017, 2:15 PM - 3:15 PM

Sorafenib has been approved for treatment of patients with radioactive iodine (RAI)-refractory differentiated thyroid cancer (DTC). Real-world studies determine how new drugs perform beyond the scope of clinical trial. In this study, we aimed to evaluate the efficacy and safety of sorafenib in real clinical practice. This multicenter, retrospective cohort study evaluated 98 patients with progressive RAI-refractory DTC who treated with sorafenib in 6 tertiary hospitals in Korea. The primary objective was the progression-free survival (PFS) according to RECIST version 1.1. The overall survival (OS), response rate, and safety were also evaluated.

The median PFS was 9.7 months and median OS has not been reached during the follow-up. Partial responses and stable disease (SD) were achieved in 25 patients (25%) and 64 patients (65%), respectively. SD more than 6 months were in 41 patients (42%). In subgroup analysis, we identified several prognostic indicators of better PFS: absence of disease-related symptom (HR=0.5, P=0.041), lung-only metastasis (HR=0.4, p=0.048); thyroglobulin reduction ≥60% (HR=0.4, p=0.012); and daily maintenance dose ≥600 mg (HR=0.3, p=0.005). The mean daily dose of sorafenib was 666 ± 114 mg. AEs and serious AEs were reported in 93 (95%) and 40 (41%) patients, respectively. The most frequent AE was hand-foot skin reaction (76%). Sorafenib improved PFS in real clinical setting, consistent with the results of DECISION trial. AEs were mostly mild and manageable. These results suggest that sorafenib is an effective treatment option for patients with progressive RAI-refractory DTC.
O19
A Controlled Clinical Trial on the Efficacy of Lithium as Adjuvant Therapy to Radioiodine in the Treatment of Hyperthyroidism

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Free Paper 4, 10 November 2017, 2:15 PM - 3:15 PM

Background: Radioactive Iodine (RAI) is one of the main treatment modalities of hyperthyroidism. However, its success rate differs between centres. One of the determining factors of RAI success is its intrathyroidal persistence. Lithium has been said to improve efficacy of RAI but it remains debatable till today.

Objective: To assess the efficacy and safety of lithium carbonate as an adjuvant therapy to RAI in the treatment of hyperthyroidism.

Methodology: This is a randomized, interventional, 2 arm parallel-group, open label single centre study carried out in Endocrinology Unit, Department of Medicine and Radionuclear Department of Penang General Hospital. The study period was from 30th August 2015 to 30th August 2016. The interventional medication is lithium carbonate 300mg twice daily for fourteen days starting on the day of RAI therapy was given to 37 subjects and no added medication to the standard RAI therapy in 38 subjects in the control group. Subjects were followed up for 24 weeks with 6 study visits to assess cure with adjustments to medications and determining cure during the study visits.

Results: There were no significant difference in the clinical, demographic and biochemical profile of the two groups. Dose of RAI was a standard 15mCi in both groups. The cure rate in RAI plus lithium group was 62.2% and the cure rate in RAI alone group was 63.2% (p=0.932). Mean time to cure in RAI plus Lithium versus RAI alone group were similar 13.6 ± 6.1 vs 13.2 ± 6.5 (p=0.841). There appears to be a trend towards better cure rate in Toxic Multinodular goitre in the RAI plus Lithium group (71.3%) versus RAI alone group (53.3%) (p=0.316). Lithium however was able to prevent thyroid hormone surge 2 weeks post RAI.

Conclusion: Lithium carbonate does not improve the efficacy of RAI significantly in hyperthyroid patients in our study. Its role in improving efficacy of RAI in toxic multinodular goitre needs further investigations.

O20
The Use of a Clinical Pathway in the Management of Adult Patients with Diabetic Ketoacidosis and Hyperglycemic Hyperosmolar State at a Private Tertiary Hospital in the Philippines: A Retrospective Cross-Sectional Comparative Study

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Diabetic ketoacidosis (DKA) and hyperglycemic hyperosmolar state (HHS) management in the inpatient setting continues to pose a challenge for healthcare providers. The use of clinical pathways is advocated worldwide but is still not widely accepted in our local setting. In 2010, The Medical City (TMC) Section of Endocrinology developed a clinical pathway for hyperglycemic crises based on the 2010 ADA recommendations and Markovitz insulin protocol. This retrospective cross-sectional study compared the clinical and safety outcomes of a clinical pathway in DKA and HHS management among adult patients admitted from January 2010 to April 2016. A total of 95 patients were divided into 2 groups: pathway group (n=60) and non-pathway group (n=35). Outcomes such as duration of insulin drip, time to reach CBG goal, number of hypoglycemic events, length of ICU stay, and length of hospital stay were similar between the two groups. Patients in the pathway group had significantly more hypokalemic events compared to the non-pathway group (54.2% vs 28.6%, p=0.019). This increased occurrence of hypokalemia may be due to the significantly higher insulin dose per patient in 24 hours (90.5 ± 6.1 vs 69.4 ± 7.6, p=0.036). Mortality was significantly higher in the non-pathway group (0 vs 8.6%, p=0.047). Direct causality of mortality was not determined in this study. In conclusion, this study shows that DKA and HHS patients managed using a clinical pathway had lower mortality rates compared to those managed without a pathway. However, there was an increase in hypokalemic events in the pathway group.
O21
Identifying Knowledge Deficits in Diabetic Patients Admitted to Endocrinology - Diabetes Department in Bach Mai Hospital using DKY Questionnaire

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10 November 2017, 2:15 PM - 3:15 PM

Introduction: Diabetes Mellitus (DM) is a major health concern with high levels of morbidity and mortality. Diabetes knowledge is considered an essential element of DM management, which can reduce the frequency of hospitalization and the time of developing complications.

Objectives: To identify knowledge deficits and to find the relationship between knowledge deficits and associated factors among diabetic patients admitted to Endocrinology – Diabetes Department, Bach Mai hospital.

Methodology: A cross-sectional study was conducted on 123 diabetic patients at Endocrinology - Diabetes Department, Bach Mai hospital. The Diabetes Knowledge Test (DKT) developed by Michigan Diabetes Research Training Centre was used for knowledge assessment. Descriptive analysis, chi square, student’s T test, ANOVA, simple regression, Pearson and Spearman correlation were performed for the data analyses.

Results: Overall, patients achieved a mean score of 7.51 ± 2.28. Knowledge deficits were apparent in some areas: diet, glucose monitoring, hypoglycemia, and long-term complications. Insulin-treated patients exhibited the lack of knowledge in the following topics: sign of ketoacidosis, duration of insulin, and cause of insulin reaction. There were no relations between age, HbA1c, duration of diabetes, diabetes treatment with diabetes knowledge (p<0.05). Relationship between level of education and diabetic knowledge reached statistical significant (p<0.05). People who had higher educational level were more likely to give correct responses.

Conclusion: Respondents’ knowledge of DM based on the DKT was at average level. Knowledge deficits were identified. People who had higher educational level were more likely to have better knowledge score.

O22
Effect of Rapid Correction of Glycemic Status on Diabetic Peripheral Neuropathy in Poorly Controlled Type 2 Diabetes Mellitus Patients

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10 November 2017, 2:15 PM - 3:15 PM

Objective: We aimed to study the effect of rapid correction of glycemic status on diabetic peripheral neuropathy in poorly controlled type 2 diabetes mellitus patients.

Methodology: A total of 74 patients with poorly controlled T2DM were included in the study. Glycemic parameters were properly controlled over a 2-month period. Neuropathy status was determined by Toronto Clinical Neuropathy Score (TCN), Neuropathy Pain Scale (NPS) and nerve conduction study (NCS) at baseline and 2 months after. The changes in neuropathy parameters in those who achieved slow (<3% HbA1c reduction) and rapid control (≥3% HbA1c reduction) were compared and correlated.

Results: After 2 months of glycemic control, mean TCN changed from 6.34 ± 0.955 at the start of study to 7.11 ± 1.390 (p=0.001). Mean NPS increased from 2.61 ± 3.704 to 6.18 ± 6.845 (p<0.001). The conduction velocities and amplitudes of all sensory nerves decreased (p<0.001). Of the 74 patients included, 36 had <3% HbA1c reduction (slow control group) and 38 achieved ≥3% HbA1c reduction (rapid control group). The mean NPS value in the slow control group was significantly lower (3.83 ± 6.579) compared to the rapid control group (8.39 ± 6.395) (p=0.003). The values of all sensory nerve conduction velocities and amplitudes did not differ between the 2 groups.

Conclusion: In our group of patients with poorly controlled T2DM with peripheral neuropathy, rapid correction of glycemic status resulted to increased pain severity. No changes were observed in sensory NCS. We found that the magnitude of change in HbA1C during a short period was a risk factor for the development of acute painful neuropathy.
Effectiveness of Long-Term Treatment with SGLT2 Inhibitors in Elderly T2DM Patients: Real-world Evidence from a Specialized Diabetes Center in Thailand

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10 November 2017, 2:15 PM - 3:15 PM

Objective: It is uncertain that data from real-world studies of SGLT2i will obtain outcomes seen in clinical trials particularly in elderly patients. We sought to examine the effects of SGLT2i in elderly diabetic patients in a real-world setting.

Methodology: Patients prescribed with and maintained on any SGLT2i for at least 6 months between 1 November 2014 and 30 June 2016 in Theptarin Hospital were included. Characteristics and metabolic parameters of elderly (age ≥65 years old) and younger patients were evaluated and compared.

Results: A total of 189 diabetic patients (female gender 50.3%, mean age 59.9 years ±12.3, T2DM 97.3%, duration of diabetes 16.3 years ± 9.2, BMI 29.9 kg/m² ± 6.1, baseline HbA1C 8.8% ±1.6) were prescribed SGLT2i during study period. Findings suggestive of genital and urinary tract infection were reported in 2.6% and 2.1% of patients, respectively. One hundred forty-six patients (43.2% of which were ≥65 years old) who continued to use SGLT2i for at least 6 months (median time 12 months) were included in analysis. At the last follow-up, median HbA1C reduction (0.6% versus 0.8%) and weight reduction (2.0 kg versus 2.2 kg) were not different in elderly and younger patients. Increased hematocrit was observed frequently in both groups of patients.

Conclusion: Treatment-associated risks and benefits should be assessed on a case-to-case basis in geriatric patients. In this real-world data, SGLT2i demonstrated safety and effectiveness in elderly patients as well as younger patients. However, elderly patients should be advised to maintain good levels of hydration in order to minimize the risk of potential adverse outcomes.

Prevalence of Undiagnosed Diabetes and Prediabetes in Vietnam: A Hospital-Based Screening Campaign

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10 November 2017, 2:15 PM - 3:15 PM

Objectives: Our study aimed to determine the prevalence of undiagnosed diabetes and prediabetes among an at-risk population and to identify factors associated with the occurrence of the said conditions.

Methodology: A cross-sectional survey with a sample of 595 volunteers was conducted at People’s Hospital 115, Ho Chi Minh City in 2016. The screening campaign was announced through leaflets, hospital postings and television communication. We included asymptomatic participants aged 18 years or older with at least one of following risk factors: age 45 years or older; BMI of 23 kg/m² or higher; family history of diabetes, hypertension or dyslipidemia; history of cardiovascular disease; previous gestational diabetes; and macrosomia. HbA1c level, which is not included in routine practice, was measured along with fasting blood glucose.

Results: Prevalence of undiagnosed diabetes and prediabetes using the American Diabetes Association 2016 criteria was 15.3% and 55.8%, respectively. Diabetes status increased with age (aOR 1.04), and was more likely among those with BMI of 23 kg/m² or higher (aOR 1.94).

Conclusions: Undiagnosed diabetes and prediabetes are prevalent among high risk individuals in Vietnam. Increasing age and BMI were found to be useful clinical indicators. Awareness campaigns and wider diabetes screening using HbA1c are recommended.
DAY 2

O25

Effectiveness of Metformin compared to Insulin to Improve Glycemic Control and Prevent Adverse Maternal and Fetal Outcomes among Patients with Gestational Diabetes Mellitus (GDM): A Systematic Review and Meta-Analysis

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Objective: To determine the effectiveness and safety of metformin compared to insulin in the management of gestational diabetes mellitus in terms of glycemic control, as well as maternal and fetal outcomes

Methodology: A meta-analysis was conducted on clinical trials of metformin versus insulin in patients with gestational diabetes mellitus using RevMan 5.3 software. Of the 76 articles identified, 11 met eligibility criteria involving 1,880 patients.

Results: Pooled data showed a non-significant trend towards improvement of glycemic control in the metformin group in terms of HbA1c [−0.03% (−0.09%, 0.03%), p=0.31]. Among the maternal outcomes, there were significantly less events of preeclampsia in the metformin group (OR 0.45, 0.28-0.71, p=0.0008). There were less births via Caesarean section in the metformin group (OR 0.99, 0.68-1.43) but were not statistically significant (p=0.94). Among the neonatal outcomes, there were significantly less neonates with birth weights of >4 kg (OR 0.69, 0.48-0.98, p=0.04), less neonatal intensive care unit admissions (OR 0.71, 0.55-0.91, p=0.005), and less jaundice (0.60, 0.36-0.99, p=0.04) in the metformin group. There was no significant difference between the metformin and insulin groups in terms of neonatal respiratory distress syndrome, neonatal hypoglycemia and prematurity.

Conclusion: The use of metformin and insulin are equally effective for glycemic control in patients with GDM. However, metformin is shown to have better neonatal and maternal safety profile based on the results of this meta-analysis.

O26

Influence of Low Glycemic Index Food Products on Daily Glucose Rate at Type 2 Diabetes Mellitus Patients

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Objective: The purpose of this study was to determine the stability of daily blood glucose (BG) level, satiety and safety of using low glycemic index food product compared with regular meals.

Methodology: This study is a preliminary, prospective, randomized, open-ended study. The food product was given 2 times a day at 60 grams each. The study was conducted for 4 months and involved 30 male and female type 2 diabetes mellitus subjects. The subjects were asked to conduct 2 visits with a wash-out period of one week. Measurement of BG using continuous glucose monitoring was performed within 48 hours of every visit. Satiety level was measured using the Satiety Quotient (SQ) questionnaire at intervals of 0, 15, 30, 60 and 120 minutes.

Results: Glycemic Response (GR) after the first 24 hours was 11.48 mg/dL in the group receiving product A and 13.71 mg/dL in the group receiving regular meals. Mean amplitude of glucose excursions (MAGE) in the group receiving product A was 104.61 mg/dL after the first 24 hours and 91.67 mg/dL after the second 24 hours. MAGE values in the group receiving regular meals were 91.33 mg/dL and 88.18 mg/dL after the first and second 24 hours, respectively. SQ questionnaire indicated that the group that consumed product A felt full faster and had less desire to eat.

Conclusions: The low glycemic index food product led to lower GR and longer satiety compared with regular meals. The decrease in MAGE after the second 24 hours was greater in the group receiving product A than the group receiving regular meals.
O27
Risk Factors for Foot Problems among Patients with Type 2 Diabetes and Chronic Kidney Disease

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Free Paper 6, 11 November 2017, 2:15 PM - 3:15 PM

Objectives: To determine the prevalence of foot problems among patients with T2DM and chronic kidney disease, and to identify risk factors that predispose these patients to foot problems.

Methodology: We implemented an analytical cross-sectional study of patients with T2DM and CKD stages I to V consulting at the National Kidney and Transplant Institute. Foot problems were assessed by inspection, palpation, use of the Michigan Neuropathy Screening Instrument, and measuring ankle brachial index. Risk factors for foot problems were analyzed by univariate and multivariate logistic regression.

Results: We analyzed 104 patients with T2DM and chronic kidney disease (mean age 47 years, 48% male, 88% CKD stage V, 73% on dialysis). We found a prevalence of foot problems of 49% (73% neuropathy, 69% neuro-ischemia, 45% peripheral arterial disease, 8% amputation, 6% active foot ulcerations and 4% foot deformities). In univariate statistical analysis, independent risk factors for foot problems included history of coronary artery disease (odds ratio (OR) 4.1, 95% CI, 1.2-13.9), history of stroke (OR 9.6, 1.2-80.4), dialytic therapy (OR 3.3, 1.3-8.3), HbA1c (p=0.008), cholesterol (p=0.048), triglycerides (p=0.018) and stage of CKD (p=0.041). In multivariate logistic analysis, risk factors for foot problems were history of coronary artery disease (OR 16.3), dialytic therapy (OR 7.6), cholesterol (OR 1.08) and triglycerides (OR 1.04).

Conclusions: The high prevalence of foot problems strongly favors the establishment of preventive foot strategies within the context of a multidisciplinary team. Patients on dialytic therapy with coronary artery disease and hyperlipidemia should be prioritized for these preventive programs.

O28
Development of a Metabolic Syndrome Severity Score and its Association with Incident Diabetes in an Asian Population – Results from a Large Longitudinal Cohort in Singapore

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Free Paper 6, 11 November 2017, 2:15 PM - 3:15 PM

Objectives: To date, there is no metabolic syndrome severity score for Asians. We aim to develop a metabolic syndrome severity score and assess its association with incident diabetes in Singapore.

Methodology: In a longitudinal study, 4109 subjects without baseline diabetes participated in a community screening program from 2013 to 2016. Metabolic syndrome (MetS) was defined according to the Adult Treatment Panel III criteria (ATP-III MetS). A MetS severity z-score was derived from standardized loading coefficients of a confirmatory factor analysis for waist circumference, triglycerides, HDL-C, blood pressure and fasting glucose. Cox proportional-hazard model was used to assess risk of diabetes by the score and change in score for the first and second screening, adjusting for MetS components, age, gender and race.

Results: There was high AUC concordance between MetS severity score and ATP-III MetS (AUC 0.91, 95% CI, 0.90-0.92). The association between ATP-III MetS and incident diabetes was attenuated from HR 3.47 (95% CI, 2.37-5.08, p<0.001) to 0.61 (0.30-1.22, p=0.165) in the adjusted model, whereas baseline MetS severity score remained significantly associated with incident diabetes in the adjusted model with HR 1.48 (1.04-2.11, p=0.031). The AUC for MetS severity score alone as a predictor of diabetes is significantly higher than that for ATP-III MetS alone (0.67 versus 0.61, p=0.004). The change in severity score was significantly associated with incident diabetes, with HR 2.09 (1.43-3.07, p<0.001), independent of baseline severity score.

Conclusion: The MetS severity score provided further prediction for incident diabetes in addition to individual MetS components. Changes in score conferred further association, highlighting the need to monitor MetS severity over time.
O29
The Changes of Blood Glucose Levels and Methods of Treatment in Pregnant Women with Gestational Diabetes Mellitus after using Antenatal Corticosteroid Therapy

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Free Paper 6, 11 November 2017, 2:15 PM - 3:15 PM

Objectives: To investigate changes in blood glucose levels in gestational diabetic patients treated with antenatal corticosteroid and the methods of treatment for these patients

Methodology: Observational prospective study in 50 gestational diabetic patients treated with antenatal corticosteroid therapy

Results: Blood glucose (BG) changes were observed during first 7 days after antenatal corticosteroid injection. Preprandial capillary BG was greater than 5.3 mmol/L in over 80% of patients on days 2 and 3, and remained elevated in over 45% on day 7. Two-hour postprandial capillary BG was greater than 6.7 mmol/L in 77.4% to 82.2% of patients on day 1 to 3, and in over 51% on day 4 to 7. Mean glucose variability ranged from 0.75 to 1.79 mmol/L. The incidence of hypoglycemic episodes was 0.74%. After corticosteroid injection, the number of patients treated with insulin increased. In the patients treated with insulin, 52% required double insulin dose. The highest increase in insulin requirement was seen on the third day after injection. There was a positive correlation between total insulin dose and HbA1c level on admission.

Conclusions: In women with gestational diabetes, BG levels increased on days 2 and 3, and decreased gradually until day 7 after antenatal corticosteroid. Most of them needed insulin or required doubling of their insulin dose to control BG level. There was a positive correlation between the total insulin dose and HbA1c level on admission.

O30
Low Carbohydrate Diet: A Review

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Free Paper 7, 11 November 2017, 2:15 PM - 3:15 PM

Background: In 2008, the American Diabetes Association suggested a low carbohydrate diet (LCD) as an alternative to the conventional low fat calorie-restricted diet (LFD) for improving glycemic control and reducing body weight.

Findings: LCDs are recommended in weight loss strategies because increasing evidence indicates that LCDs are superior to conventional LFDs in lowering glycated hemoglobin and triglyceride levels and increasing high-density lipoprotein cholesterol levels. However, many healthcare professionals, including dieticians and physicians, who provide nutritional advice to patients with diabetes have remained unfamiliar with LCDs, and others have not accepted LCDs despite a large body of scientific evidence. Some critics think it impossible that a diet with higher fat content could improve lipid profile (especially atherogenic dyslipidemia) more effectively than a diet with lower fat content.

Conclusion: We reviewed some recent randomized diet intervention trials comparing LCDs and LFDs, as well as the basic science underlying LCDs. It seems that LCD is effective in reducing body weight and improving glycemic control and atherogenic dyslipidemia.
O31
The Effect of Individualized Glycemic Intervention for Patients with Diabetic Foot Ulcer (EIGIFU)

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Objective: Diabetic foot ulcers (DFU) are common complications of diabetes mellitus (DM). To date, no prospective study has been performed to assess the effect of glycemic control in patients with DFU. This is a pilot study conducted to evaluate the association of effect of HbA1c reduction and wound healing.

Methodology: A 12-week prospective, non-controlled, open label, interventional study in subjects with suboptimally controlled type 2 DM with DFU was conducted. Anti-diabetic medications were adjusted with the aim of at least 1% in relation to the patient’s individualized HbA1c target. The wound area was determined at each visit by using specific wound tracing. The daily wound area healing rate was calculated in cm² per day as the difference between wound area at first visit and the subsequent visit divided by the number of days between the two visits.

Results: A total of 19 patients were included in the study. There was a significant mean HbA1c reduction from 10.33% to 6.89% (p<0.001) with no severe hypoglycemia. The mean degree of HbA1c reduction rate was 31.2 ± 7.5%, while the median daily wound area healing rate was 0.2485 ± 0.4353 cm²/day. There was a strong positive correlation between these two variables (r=0.752, p=0.01). After dividing the patients into 2 quartiles based on final HbA1c (first quartile versus third quartile), there was a significant difference of daily wound area healing rate (0.597 versus 0.044 cm²/day, p=0.012).

Conclusion: Even in a small group of DFU patients, the study emphasized the importance and benefits of achieving a lower HbA1c in wound healing.

O32
Sudoscan Performance as a Screening, Diagnostic and Foot Ulcer Risk Predicting Tool for Diabetic Polyneuropathy Compared to Conventional Methods

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Free Paper 7, 11 November 2017, 2:15 PM - 3:15 PM

Objective: Sweat gland innervation is structurally similar and damaged by similar metabolic insult to small sensory nerves in diabetic polyneuropathy (DPN). This study evaluates effectiveness of Sudoscan, a new device for sweat gland function measurement, in detecting diabetic polyneuropathy (DPN) compared to conventional methods.

Methodology: In this cross-sectional study, 332 Chinese diabetes patients with or without neuropathy underwent neuropathic assessment with Neuropathic Disability Score (NDS), Vibration Perception Threshold (VPT) and nerve conduction studies. Sudoscan measures electrochemical skin conductance (ESC) of the hands and feet through reverse iontophoresis. Confirmed DPN was determined by NDS >2 with more than one abnormal nerve conduction velocity (NCV), while increased risk for diabetic foot ulcer was pegged at NDS score ≥6. Receiver-operating characteristic (ROC) curves were calculated to evaluate the efficacy of Sudoscan compared to VPT.

Results: ESC was lower in patients with DPN than in the normal cohort (p<0.001). Feet ESC significantly correlated with hand ESC (r=0.701, p<0.001), toe VPT (r=-0.352, p<0.001), NDS score (r=-0.245, p<0.001), sural NCV (r=0.388, p=0.001) and peroneal NCV (r=0.485, p<0.001) and peroneal NCV (r=0.485, p<0.001). On the ROC curve, ESC exhibited better screening performance than VPT (AUC=0.925 and 0.76, respectively). ESC was found to have high sensitivity (77.6%) and specificity (100%) in detecting neuropathy by NDS or NCS. ESC, compared to VPT, also yielded better diagnostic performance (AUC=0.721 and 0.676, respectively) with 54.34% sensitivity and 78.63% specificity in detecting confirmed DPN. Using NDS ≥6 as standard reference, feet ESC had comparable performance to VPT (AUC=0.741 versus 0.751) in diabetic foot ulcer prediction.

Conclusion: Sudoscan is a promising, easy, quick, inexpensive and quantitative device which should be considered as part of DPN screening, especially for busy outpatient clinics.
O33  
Outcome of Diabetic Foot Patients after the Revision of the Diabetic Foot Protocol in Corazon Locsin Montelibano Memorial Regional Hospital

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Free Paper 7,  
11 November 2017, 2:15 PM - 3:15 PM

Background: Diabetic foot infections are prevalent. It causes undue burden to patients due to high risk of morbidity, high recurrence rate and increased risk of amputation.

Objectives: This study aims to compare the outcome of patients with diabetic foot infections in Corazon Locsin Montelibano Memorial Regional Hospital pre- and post-revision of the Diabetic Foot Protocol in terms of amputation rate, mortality rate and length of hospital stay.

Methodology  
Participants: All patients 19 years old and above admitted from March 2012 to February 2016 and diagnosed with diabetic foot infection were included in the study.

Outcome measures: We compared data such as age, sex, admission white blood cell count, capillary blood glucose levels, creatinine clearance, glycosylated hemoglobin and Wagner classification, length of hospital stay, co-morbidities, culture results of wound specimen, number of amputations and number of deaths of patients pre- and post-protocol revision.

Analysis: Levene’s test for equality of variances, t-test for equality of means and length of hospital stay (significant p value <0.05) and p values were reported.

Results: Mortality was reduced from 22% (n=71) to 8% (n=27) after protocol revision. The number of amputations (51%, n=164) was statistically higher after revision. The most common cause of mortality was sepsis, while the most common reason for prolonged hospitalization was delayed surgery. The average length of hospital stay was 8 days.

Conclusions: After the revision of the Diabetic Foot Protocol, the team achieved its goal of decreasing the mortality rate from 22% to 8%. This study proposes further revisions to decrease the amputation rate and hospital stay, and includes recommendations to further improve the protocol.

O34  
Physical Frailty and Cognitive Impairment Associated with Diabetes: Disability Prevalence and Mortality Risk

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Background: Diabetes ranks 11th in the world’s leading cause of disease burden in 2015. Physical frailty and cognitive impairment are common in diabetes, but their impact on disability and mortality are not well studied.

Methodology: Community-living participants (n=2702) aged 255 years were assessed at baseline to determine the prevalence of diagnosed diabetes, physical frailty (defined by the Cardiovascular Health Study criteria) and cognitive impairment (Mini-Mental State Examination ≤23), functional disability [instrumental activities of daily living (IADL) and activities of daily living (ADL) dependency] and followed up (mean 10.2 years) for mortality outcome.

Results: Diabetes was significantly associated with higher prevalence of frailty (OR=2.90, 95% CI, 1.58-5.32) and frailty with cognitive impairment (OR=2.77, 95% CI, 1.64-4.67). Among 487 participants with diabetes, compared to non-frailty without cognitive impairment, cognitive impairment alone was not significantly associated with IADL (OR=0.6, 95%CI, 0.1-3.1), but physical frailty alone was associated with considerably higher prevalence of IADL (OR=15.0, 95% CI, 1.7-128.3) and ADL disability (OR=3.9, 95% CI, 0.7-21.4). Physical frailty with cognitive impairment was associated with considerably higher prevalence of IADL (OR=18.1, 95%CI, 12.2-151.2) and ADL disability (OR=93.6, 95%CI, 17.9-489.9). Physical frailty with cognitive impairment individually and in combination was associated with worse mortality outcomes: cognitive impairment alone (HR=2.2, 95%CI, 1.1-4.7), frailty alone (HR=3.7, 95% CI, 1.5-9.5) and frailty with cognitive impairment (HR=15.5, 95%CI, 5.6-32.4).

Conclusion: Frailty and cognitive impairment in diabetes adversely impact functional and mortality outcomes; the worst outcome was associated with the combined presence of frailty and cognitive impairment. In management of older people with diabetes, there is a need go beyond a gluco-centric to an individualized approach that emphasizes functional performance with quality of life and well-being.
O35
Cardiovascular Risk Factors in a Suburban Population in Makassar, Indonesia

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11 November 2017, 2:15 PM - 3:15 PM

Background: Cardiovascular disease is the leading cause of death worldwide. While it is also seen in developing countries such as Indonesia, there are limited data from population-based studies. We report the cardiovascular risk factors in a sub-urban population in Makassar.

Methodology: Adults from Rappocini district in Makassar were invited for interview and physical examination, including blood pressure, weight, height and waist circumference. Tests for fasting plasma glucose and lipid profiles were performed in the central laboratory Prodia. Cut-offs were set to diagnose obesity (BMI ≥25 kg/m², male waist circumference ≥90 cm, female waist circumference ≥80 cm), hypertension (BP ≥140/90), diabetes (fasting plasma glucose ≥126 mg/dL) and abnormal lipid profiles [National Cholesterol Education Program (NCEP) - Adult Treatment Panel (ATP) III criteria].

Results: A total of 3,502 subjects were included, age 21 to 70 years. The most prevalent risk factor was obesity by waist circumference (55.7%) and BMI (47.4%). High blood pressure (39.0%), high LDL-C (29.5%), low HDL-C (13.8%), high triglycerides (13.1%) and diabetes mellitus (9.1%) were also found in the population studied.

Conclusion: This study provided evidence that even in a sub-urban population, cardiovascular risk factors, especially obesity, hypertension and high LDL-cholesterol, were also prevalent.

O36
The Prevalence of Familial Hypercholesterolemia among Adult Filipino Patients at Universidad de Santa Isabel Health Services Department: An Observational Descriptive Prospective Study

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Free Paper 8,
11 November 2017, 2:15 PM - 3:15 PM

Objective: To determine the prevalence of familial hypercholesterolemia (FH) among adult Filipino patients with dyslipidemia seen at Universidad de Santa Isabel Health Services Department between June 2016 to June 2017.

Methodology: Patients age 19 years and older with dyslipidemia were assessed using the Dutch Lipid Network Criteria (DLNC) for the diagnosis of FH.

Results: Four hundred patients were included in the study, with an age range of 22 to 96 years. Two hundred forty two subjects (60.5%) were female. Of the four hundred subjects, DLNC scores were unlikely FH in 108 (27%), possible in 145 (36.25%), probable in 88 (22%) and definite in 59 (14.7%).

Conclusion: In our population, we found a prevalence of 14.7% of definite FH based on DLNC score among patients with dyslipidemia, in the absence of DNA analysis. The estimated prevalence worldwide is 0.2% to 0.5% (1 in 200 to 500). Current guidelines in Asia have been unable to provide true estimates for its prevalence, which is attributed to the lack of country-specific data on FH. Our findings will hopefully raise the awareness of healthcare providers, particularly on its implications on the risk for early cardiovascular events and the need for early detection and management of FH in patients and their relatives.
**O37**

**Association of Plasma Apolipoprotein E Level with Lipid Profile in Patients with Coronary Artery Disease**

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**Free Paper 8,**  
11 November 2017, 2:15 PM - 3:15 PM

**Background and Objectives:** Apolipoprotein E (apoE) has promising anti-atherogenic effects by removing TG-rich lipoproteins from circulation to prevent the development of coronary artery disease. We aimed to find the association of plasma apoE level with lipid profiles in patients with CAD.

**Methodology:** A population of 40 patients with CAD and 33 without CAD were included in a cross-sectional comparative study. The participants were age 36 to 84 years, including both sexes. Plasma apolipoprotein E levels were determined by ELISA and lipid profiles by enzymatic method.

**Results:** We found that CAD patients had significantly lower apoE and HDL-C levels, and higher TG and total cholesterol levels, compared to those without CAD. Among the lipid profile parameters, plasma TG level showed significant association (p<0.05) with apoE levels in the CAD group. This suggests a more prominent role of plasma apoE in the metabolism of TG-rich lipoproteins in CAD patients compared to those without CAD.

**Conclusion:** Plasma apoE level was found to be associated with TG in patients with CAD. While plasma TG is currently accepted as an independent risk factor if CAD, plasma apoE may have a potential role as an alternate predictor of CAD.

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**O38**

**Bariatric Surgery versus Medical and Lifestyle Therapy for Diabetes Mellitus: A Systematic Review and Meta-Analysis**

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**Free Paper 8,**  
11 November 2017, 2:15 PM - 3:15 PM

**Objective:** To estimate the effects of bariatric surgery on type 2 diabetes mellitus remission and changes in body mass index, fasting blood sugar, glycated hemoglobin, blood pressure, and cardiovascular outcomes

**Methodology:** We searched MEDLINE, CENTRAL, ClinicalTrials.gov and grey literature until April 2016. We included RCTs comparing bariatric surgery versus medical and lifestyle intervention that enrolled adult T2DM patients with a BMI of at least 27 kg/m². Two authors independently abstracted data, assessed studies for risk of bias, and calculated pooled estimates of treatment effects.

**Results:** Out of 745 studies from our initial search, 14 studies, including 1056 patients, met our inclusion criteria. The studies were assessed to have high risk of performance bias due to the open label nature of the studies. Pooled analysis significantly favored surgery (RR 13.38, 95% CI, 4.68-38.27). In the subgroup analysis, only Roux-en-Y gastric bypass (RYGB) was more effective in achieving complete diabetes remission (RR 13.32, 95% CI, 4.25-41.7). At 3 years, surgery still showed significant benefit in achieving remission (RR 18.79, 95% CI, 3.80-92.9). RYGB also exhibited higher chance of achieving an HBA1c <7% (RR 2.54, 95% CI, 1.35-4.76) and greater reduction in BMI and FBS (MD -8.50, 95% CI, -9.64 to -7.36; MD -28.12, 95% CI, -47.71 to -8.54; respectively). Adverse events, however, were more frequent in RYGB.

**Conclusion:** Bariatric surgery is effective in achieving diabetes remission and improving some of the metabolic and glycemic parameters among obese diabetic patients. This was observed mostly among those who underwent RYGB albeit with more adverse events.
Body Composition and Metabolic Effects of 12 Weeks of High Intensity Circuit Training (HICT) in Obese Individuals without Diabetes

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Objective: The aim of the study was to determine the effects of 12 weeks of HICT on body composition, metabolic parameters and physical fitness in obese individuals without diabetes mellitus.

Methodology: Forty participants (age 38.03 ±7.04 years, BMI 31.23 ± 2.52 kg/m²) confirmed to be without diabetes mellitus through oral glucose tolerance test were randomly assigned to two intervention groups. The HICT group was required to complete 36 sessions of 1 hour training in 12 weeks. The control group was given lifestyle modification and home exercise advice. Baseline and after intervention body weight, BMI, waist circumference, fat mass, muscle mass, diastolic and systolic BP, glucose excursion with OGTT, lipid profile and physical fitness assessment were measured.

Results: The HICT group showed significant reductions in body weight (5.66 ± 2.87 kg versus 1.36 ± 1.24 kg, p<0.01), BMI (2.23 ± 1.14 kg/m² versus 0.61 ±0.54 kg/m², p<0.01), waist circumference (10.61 ± 4.23 cm versus 4.81 ± 4.76 cm, p<0.01), fat mass (4.01 ±3.41 kg versus 1.02 ±0.98 kg, p<0.01) and systolic BP (11.95 ± 11.49 mmHg versus 2.50 ± 6.70 mmHg, p<0.01) compared to the control group. Improvement in glucose excursion at 60 minutes post intervention was not statistically significant. There were no significant changes in lipid profile in the HICT group compared to control. Physical fitness was significantly improved in the HICT group.

Conclusion: Our findings showed that HICT is an effective weight loss intervention in obese individuals. Although limited effects on glycemic and lipid parameters were seen, a longer duration of sustained weight loss may possibly elucidate more significant results.

Incidence and Prevalence of Post-Surgical Hypoparathyroidism in Korea

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Objective: The epidemiology of post-surgical hypoparathyroidism (hypoPT) in Korea is not very well known. This study aimed to investigate the prevalence and incidence of post-surgical hypoPT in Korea.

Methodology: Health insurance claims data for patients with a diagnosis of post-surgical hypoPT were extracted from the database of the National Health Insurance Sharing Service (NHISS) provided by the National Health Insurance Corporation (NHIC) in Korea. This covers almost all Korean residents, approximately 50 million in total, including detailed files of outpatient, emergency, inpatient and pharmacy treatment records from 1 January 2003 to 31 December 2015. Post-surgical hypoPT was identified using International Classification of Diseases (ICD)-10-CM diagnostic codes, as well as following neck surgery that necessitated treatment with calcium and/or vitamin D analog supplementation for more than 2 times a year.

Results: During the inclusive years, the prevalence of post-surgical hypoPT increased from 0.0016% to 0.013%. The incidence (per 100,000) increased throughout the years from 3.02 (2.87 to 3.18) in 2008 to 6.07 (5.86 to 6.28) in 2014. However, the incidence dropped abruptly in the year 2015 to 3.24 (3.25 to 3.57). The incidence was generally low compared to the previous studies performed in other countries. This may be attributed to advances in surgical skills to localize and preserve the unaffected parathyroid gland(s).

Conclusion: Our findings showed that HICT is an effective weight loss intervention in obese individuals. Although limited effects on glycemic and lipid parameters were seen, a longer duration of sustained weight loss may possibly elucidate more significant results.

Conclusions: This study demonstrated a substantial increasing trend in post-surgical hypoPT prevalence during 2003 to 2014 in Korea, but this was relatively less compared to data from other countries. The reason for the sudden decrease in incidence in 2015 may be the recognition of over-diagnosis of thyroid cancer leading inevitably to more surgical complications such as hypoPT.
**O41**

**Vitamin D Status in Infants during the First 9 Months of Age and its Effect on Growth and other Biochemical Markers: A Prospective Cohort Study**

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*Free Paper 9, 11 November 2017, 2:15 PM - 3:15 PM*

**Background**: We planned this prospective cohort study in term newborn babies to determine the incidence of vitamin D deficiency in infancy and to determine the level of vitamin D which triggers the physiologic PTH axis of the body to differentiate truly deficient from sufficient vitamin D status.

**Methodology**: Ninety six participants at birth were enrolled and followed up until 9 months of age. Serum 25(OH)D was estimated in cord blood at birth and at 14 ±1 weeks of life. Seventy-seven participants were followed up at 9 months for estimation of serum 25(OH)D, PTH, alkaline phosphatase, calcium and phosphorus. Vitamin D deficiency was defined as serum 25(OH)D <15 ng/mL as per United States Institute of Medicine guidelines.

**Results**: Serum 25(OH)D levels at 9 months of age (15.78 ±8.97 ng/mL) were significantly increased in comparison to levels at 3 months of age (14.04 ±7.10 ng/mL) and at birth (8.94 ±2.24 ng/mL). At birth all the participants (77) were deficient in 25(OH)D levels. It was found that 16/94 (17%) and 19/77 (24.7%) participants at 3 and 9 months of age, respectively, became vitamin D sufficient without any vitamin D supplementation. There was a significant inverse correlation between serum 25(OH)D and PTH concentration ($r=-0.522$, $p<0.001$), and serum 25(OH)D and ALP ($r=-0.501$, $p<0.001$). Reduction in serum vitamin D level to below 10.25 ng/mL resulted to a surge of serum PTH.

**Conclusion**: Vitamin D deficiency is common from birth to 9 months of age. The incidence decreases spontaneously even without supplementation.

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**O42**

**Osteoporosis Self-Assessment Tool for Asians (OSTA) Score and Quantitative Ultrasound (QUS) in the Diagnosis of Osteoporosis in Postmenopausal women**

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*Free Paper 9, 11 November 2017, 2:15 PM - 3:15 PM*

**Objective**: To determine the accuracy of OSTA score and quantitative ultrasound technique (QUS) compared to the gold standard method dual energy X-ray absorptiometry (DXA) scan in the diagnosis of osteoporosis in postmenopausal women in Myanmar

**Methodology**: This study was a hospital-based cross-sectional observational descriptive study. A total of 64 postmenopausal women more than 50 years of age were recruited according to selection criteria from teaching hospitals of University of Medicine 2 during the one-year study period in 2013. All patients were assessed by OSTA score and BMD at calcaneum by QUS. The presence or absence of osteoporosis was confirmed in all patients by DXA scan at the lumbar spine and hips.

**Results**: Our findings showed that 31.3% of the study population had osteoporosis and 39.1% had osteopenia at the lumbar spine. There was no patient with osteoporosis at the femoral neck but 18.8% had osteopenia. The sensitivity and specificity of OSTA for lumbar spine osteoporosis were 55% and 47.7%, respectively. Accuracy was 50%. The sensitivity of QUS was only 10%, while specificity was 86.4%. Accuracy was 62.5%. Combination of OSTA and QUS yielded a sensitivity of only 10%, specificity of 97.7% and accuracy of 70.3%. The association between the combined methods and DXA results was not statistically significant ($p=0.228$).

**Conclusion**: Both OSTA score and QUS (alone or in combination) cannot be used confidently as alternative methods for diagnosis of osteoporosis in postmenopausal women compared to DXA scan. Further studies with larger sample sizes for the Myanmar population are still needed.
**Development and Validation of a Sunlight Exposure Questionnaire for Use among Urban Adult Filipinos**

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**Objective:** To develop and validate a self-reported sunlight exposure questionnaire (SEQ) for use in an urban adult Filipino population.

**Methodology:** The study included urban adult residents in Metro Manila, Filipinos, who are well-versed in the Filipino language. Exclusion criteria included pregnancy, active skin disorders and immunocompromised states. An expert panel was formed to create a questionnaire in Likert scale format based on 4 existing instruments. The study proceeded in 5 phases: conceptual framework development using focus group discussions; questionnaire item development; translation and back-translation; pretesting; and construct validity and reliability testing using factor analysis, Cronbach’s-alpha coefficient and the paired t-test. Statistical significance was defined as $p<0.05$.

**Results:** A 25-item self-administered Filipino SEQ answerable by a 4-point Likert scale was created. The questionnaire was administered to 260 participants twice within a two-week interval. All questionnaire items possessed adequate content validity indices of at least 0.83. After factor analysis, three questionnaire domains were identified: intensity of sunlight exposure, factors affecting sunlight exposure and sun protection practices. Internal consistency was satisfactory for both the overall questionnaire (Cronbach’s-alpha 0.7970) and for each of the domains (Cronbach’s-alpha 0.7375, 0.7079 and 0.7147, respectively.) No statistically significant differences were observed in the responses between the first and second tests, indicating good test-retest reliability.

**Conclusion:** We developed a culturally-appropriate SEQ with sufficient content validity, construct validity, and reliability to assess sunlight exposure among urban adult Filipinos in Metro Manila, Philippines. The questionnaire can be eventually utilized to evaluate associations with the gold standard, serum 25-hydroxy vitamin D levels.

**Role of IGF-1 in Growth Retardation of Thalassemic Adolescents**

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**Free Paper 10, 11 November 2017, 2:15 PM - 3:15 PM**

**Objective:** The aim of the study was to determine the role of insulin like growth factor-1 (IGF-1) in growth retardation of thalassemic adolescents.

**Methodology:** The study included 103 thalassemic adolescents, consisting of 56 girls and 47 boys aged 13 to 18 years, attending Day Care Center, Yangon Children’s Hospital. Growth retardation was determined according to height-for-age (HFA) SD score. Patients with HFA between -2SD and -3SD were classified as short-statured, while those with ≤-3SD were considered severely short-statured. Growth velocity was determined using the difference in height between two visits with at least six months interval. Serum IGF-1 level was determined by sandwiched ELISA method.

**Results:** Of 103 patients, 86.4% (n=89) had growth retardation, of which 29.2% (n=26) were short-statured and 70.8% (n=63) were severely short-statured. The remaining 14 patients exhibited no growth retardation. No significant difference in serum IGF-1 levels was seen between the patients with and without growth retardation ($p=0.83$). However, serum IGF-1 levels of the patients with severe short stature were significantly lower compared to those with short stature ($p=0.03$). A strong positive correlation was seen between serum IGF-1 level and growth velocity ($r=0.58, p<0.001$) in the patients.

**Conclusion:** Retarded growth is found to be highly prevalent in thalassemic adolescents attending Day Care Center, Yangon Children’s Hospital. IGF-1 may have a significant role in severe growth retardation and impaired growth velocity in these thalassemic adolescents.
**O47**

**School Performance of Girls with Turner Syndrome: A Transcultural Assessment**

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**Free Paper 10, 11 November 2017, 2:15 PM - 3:15 PM**

**Objectives:** Specific cognitive phenotypes in Turner syndrome (TS) may cause selective learning difficulties. We analyzed real-life school performance of TS girls in primary school.

**Methodology:** Forty-four Czech and 50 Egyptian TS girls with median age of 13.5 years attending a public primary school participated. Their karyotypes and corresponding frequencies were 45,X (n=43); 46,XX (11); 45,X/46,XX (17); 45,X/47,XXX (2); 45,X/46,XiXq (7); 45,X/46,XdelX (6); 45,X/46,XrX (3); and 45,X/46,XY (5). Czech participants retrospectively collected school testimonials from classes 1-9 of the TS girl and her two sisters and/or age-matched female schoolmates. In Egypt, only recent school testimonials were evaluated. The school results were converted to a 5-grade scale, 1 for excellent until 5 for unsatisfactory.

**Results:** Longitudinal data revealed similar performance in TS girls and their sisters/peers during the first two classes. In classes 3 to 5, TS girls performed slightly worse (mean grade 1.61) than controls (mean grade 1.49) in principal teaching subjects (Maths, Native Language and 1st Foreign Language; p=0.055). In classes 6 to 9, TS girls performed slightly worse in Maths only (class 6-7, mean grade 2.21 versus 1.94, p=0.054; class 8-9, mean grade 2.41 versus 2.08, p=0.057). In the cross-sectional study in Egypt, the results of the TS girls were similar to their sisters and peers in all subjects except Maths (TS, mean grade 3.58; controls, 3.19; p=0.014). In pooled results from three principal teaching subjects, TS girls performed just slightly worse than controls (3.11 versus 2.92, p=0.043).

**Conclusion:** The differences in primary school results between TS girls and unaffected controls are minor and do not burden their general educational outcome.
P1
Serum Asymmetric Dimethylarginine (ADMA) Level and Insulin Resistance in Prediabetes and Diabetes

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Background: Both prediabetes and diabetes are associated with insulin resistance and confer a higher risk for atherosclerosis-related cardiovascular diseases. Asymmetric dimethylarginine, a competitive inhibitor of nitric oxide synthase (NOS), is considered a marker of endothelial dysfunction. Increased levels could accelerate atherogenesis in prediabetes and diabetes.

Objective: To determine the association between serum asymmetric dimethylarginine level and insulin resistance status in the study population

Methodology: A total of 92 participants were classified as normoglycemic (n=28), prediabetic (n=34) and diabetic (n=30). Insulin resistance was determined using homeostasis model assessment of insulin resistance. Plasma glucose concentrations were measured spectrophotometrically, while serum insulin and ADMA concentrations were measured using ELISA method.

Results: Mean serum ADMA level was significantly higher in the prediabetes group (0.85 ±0.1 μmol/L) compared to the normoglycemic group (0.61 ±0.04 μmol/L) (p=0.01). There were no significant differences between the normoglycemic and diabetic groups (0.67 ±0.06 μmol/L) or between the prediabetic and diabetic groups (both p>0.05). The median serum ADMA level of the study population was 0.63 μmol/L. Seventy percent of patients with diabetes and 44.1% of those with prediabetes were found to be insulin resistant. No significant association was found between serum ADMA level and insulin resistance status (p=0.6). The total mean BMI was 26.08 ±0.44 kg/m². A positive correlation was seen between BMI and serum ADMA level (r=0.24, p=0.01).

Conclusion: Increased serum ADMA in prediabetes suggests increased atherosclerosis risk in the early impaired glycemic state. Serum ADMA concentration seemed to be more related to obesity rather than serum glucose level and insulin resistance status.

P2
Individualized A1C Targets versus A1C <7% as a Key Performance Indicator – Lessons Learned from a Tertiary Diabetes Center in Thailand

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Objective: Shortcomings of one-size-fits-all dichotomous A1C targets have been addressed in various diabetes guidelines. However, performance measurement data are very limited to document the impact of A1C goal achievement through individualized A1C targets. The aim of this study was to compare the rate of goal achievement with individualized A1C targets versus A1C <7%.

Methodology: Individualized A1C target values were set as part of an annual quality improvement program at Theptarin Hospital, a multidisciplinary diabetes center in Bangkok. Medical records of 400 randomly selected type 2 diabetes patients were audited. The rate of goal achievement with individualized A1C targets versus A1C <7% was examined.

Results: Individualized A1C target values of <6.0, <6.5, <7.0, <7.5, <8.0,<8.5,<9 and <9.5% were set in 0.3, 11.0, 62.7, 14.7, 9.0, 1.2, 0.7 and 0.3% of patients, respectively. While 53.5% of the patients achieved an A1C level of <7%, 60.8% of the patients achieved their individualized A1C goal. The patients who failed to achieve the individualized goal showed higher rates of insulin usage compared to those who achieved the goal.

Conclusions: The application of individualized A1C targets resulted in an achievement rate that was 7.3% higher in comparison to a target A1C level of <7%. These results highlight that physicians should document an individualized glycemic treatment goal. Periodic evaluation should be done based on updated individualized A1C goals to prevent over- or under-treatment in diverse diabetic patients.
P3

Trans-anethole Ameliorates Obesity via Induction of Browning in Diet-induced Obese Mice

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Objectives: Pharmacologic induction of brown adipocyte-like phenotype in white adipocytes (browning) is considered a novel strategy against obesity due to its effect in increasing energy expenditure. We found that trans-anethole (TA), a flavoring substance present in the essential oils of plants, possesses the capacity to recruit browning adipocytes both in 3T3-L1 adipocytes and in obese mice fed a high fat diet.

Methodology: Induction of browning by TA was investigated by determining the expression levels of core brown adipocyte-specific genes and proteins by real-time reverse transcription polymerase chain reaction and immunoblot analysis in both 3T3-L1 adipocytes and white adipose tissue (WAT) of diet-induced obese mice.

Results: Oral administration of TA (100 mg/kg) markedly reduced body weight gain (27.3% reduction for 8 week treatment) in C57BL/6 obese mice fed a high fat diet. TA significantly increased expression of BAT signature proteins in a dose-dependent manner as well as their corresponding genes and beige-specific genes in 3T3-L1 adipocytes and in obese mice fed a high fat diet.

Conclusion: Our findings suggest that TA plays a dual modulatory role in induction of browning and promotion of lipid metabolism in white adipocytes. These findings have potential therapeutic implications for the treatment of obesity.

P4

Whole Exome Sequencing on a Large Cohort of Severely Obese Individuals to Investigate Pancreatic β-cell Function Related Protein-coding Variants Potentially Protective against Type 2 Diabetes in the Metabolically Healthy Non-Diabetic Group

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Objective: A non-trivial population of individuals manages to maintain non-diabetic range euglycemia despite being severely obese, i.e. the metabolically healthy obese (MHO). Our objective is to investigate protein-coding variants related to β-cell function that are potentially protective against type 2 diabetes (T2D) in a large group of severely obese individuals with and without T2D.

Methodology: Whole exome sequencing was performed on 186 subjects, of which 104 were non-T2D and 82 with T2D (age 41 ±10 years, 54.3% females, BMI 42.3 ±9.2 kg/m²). Mutations in 16 β-cell-related genes (HNF1α, HNF1β, HNF4α, GCK, NEUROD1, PDX1, ABCC8, PPARG, KLF11, PAX4, INS, INSR, CEL, BLK, LMNA, and KCNJ11) known to cause monogenic diabetes were analyzed and stratified by diabetes status. Additionally, individual risk scores assigned to 8 variants in 5 β-cell genes encoding transcription factors (HNF1α/HNF1β/HNF4α/PAX4/PDX1) were combined into a single genetic risk score. Test for association was performed using Chi-square and Mann-Whitney tests.

Results: Non-T2D obese subjects showed robust β-cell compensation with declining insulin sensitivity, accounting for the higher glucose disposition index (p<0.001) compared to their T2D counterparts. There was no significant difference in the frequency of mutations in the 16 genes between subjects with and without T2D (all p>0.05). Twenty-six non-T2D and 19 T2D subjects had at least one potentially functional variant in the 5 transcription factor genes (prevalence p=0.772), and produced an aggregate risk score of 16.5 and 11 (p=0.697), respectively.

Conclusion: Non-T2D subjects demonstrated robust β-cell compensation in the face of deteriorating insulin sensitivity. However, this cannot be explained by differences in protein-coding variants related to β-cell function candidate genes.
Rare Adrenocortical Carcinoma Presenting with Cushing’s Syndrome: A Case Report

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Background: Adrenocortical carcinoma (ACC) is rare endocrine cancer with poor prognosis. While most ACCs are non-functioning, 30-50% produce corticosterone, aldosterone or sex steroid.

Case: A 65-year-old woman presented with round face, incidental bruising and weight gain for 6 months. Physical examination showed dorsocervical and supraclavicular fat pads, abdominal obesity, multiple ecchymoses at the extremities and grade 4/5 proximal muscle weakness. A loss of height of 7 cm was also noted upon comparison with her previous height. Axial BMD T-score revealed osteoporosis. 25-hydroxy vitamin D level was 12.59 ng/mL (reference value >30 ng/mL). Laboratory evaluation of hypercorticolism showed high 24-hour urinary free cortisol (477.02 and 397.88 μg/day) and low normal ACTH level. The abdominal CT scan revealed a large heterogenous hypervascular left adrenal mass measuring 5.9 cm x 6.2 cm x 6.6 cm. Left adrenalectomy was performed and subsequent histopathologic examination demonstrated adrenocortical carcinoma with lymphatic emboli. Radiation therapy was prescribed as adjuvant treatment. After tumor resection, features of fat redistribution gradually resolved within several months. Follow-up abdominal CT scan revealed complete resolution of tumor. Osteoporosis medications were given to prevent future fracture.

Conclusion: Adrenocortical carcinoma may present with clinical Cushing’s syndrome. Tumor resection and treating complications of hypercortisolism are the gold standard in the management of cortisol-secreting ACC.

Bilateral Adrenal Adenoma with Concomitant Hypercortisolism and Hyperaldosteronism

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A number of autopsy studies have examined the frequency of adrenal masses. In a report of 25 studies, the overall prevalence of adrenal tumors is 5.9%.

Most reports in literature define adrenal tumor characteristics based on single or unilateral lesions. Guidelines and reviews have been formulated and published to aid clinicians in management. However, a number of open questions remain and controversial debates on the quality of diagnostic tests that are currently employed for patients with adrenal tumors still abound.

Given our current approach to its diagnosis and treatment, in the rare instance where not one, but both adrenals have lesions; and not one, but two hormones are over secreting; what dilemmas do we expect in the management of such cases?
**P7**

**A Lady with MEN-2**

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**Introduction:** Multiple endocrine neoplasia type 2A is a rare familial cancer syndrome caused by a mutation in the RET proto-oncogene. It is characterized by medullary carcinoma of the thyroid, pheochromocytoma and parathyroid hyperplasia.

**Case:** A 47-year-old lady with known pheochromocytoma treated with left adrenalectomy 21 years ago presented again with paroxysmal spells, right lower chest pain and goiter. Her mother had goiter and type 2 diabetes. On examination, she had multinodular goiter and BP ranging from 140/90 to 240/130, on irregular antihypertensive medications. Laboratory results revealed urinary VMA of 31.3 mg/24 hours (reference value 1-11 mg/24 hours), calcitonin 1840 pg/mL (reference value 0-10 pg/mL) and CEA 70.14 ng/mL (reference value 0-4.7 ng/mL). Thyroid profile, PTH, calcium and phosphate were normal. MRI of the abdomen and pelvis showed a 6 cm x 6.9 cm mixed cystic and solid right adrenal mass and a 1.7 cm x 1.8 cm solid left adrenal mass. She was diagnosed with MEN 2A with pheochromocytoma (bilateral adrenal tumor) and medullary thyroid carcinoma. Laparoscopic right adrenalectomy and total thyroidectomy were done. Histopathologic reports were consistent with pheochromocytoma and medullary thyroid carcinoma. Two weeks after surgery, her BP became normal without anti-hypertensive medications. Her calcitonin level also normalized. She is taking steroid and thyroxine replacement together with calcium and vitamin D.

**Conclusion:** The case illustrates the need to observe recurrence of pheochromocytoma and subsequent appearance of other components of MEN-2.

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**P9**

**A Rare Case of Aldosterone-Producing Adrenocortical Carcinoma with Co-secretion of Cortisol and Estradiol**

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**Introduction:** Adrenocortical carcinoma is a rare malignancy with an incidence of one to 2 per million population per year. Aldosterone-producing adrenocortical carcinoma comprises less than 7% of all functioning adrenocortical carcinomas. We report a rare case of adrenocortical carcinoma with a clinical picture of primary aldosteronism and subclinical Cushing’s syndrome and feminization.

**Case:** An 18-year-old male presented with uncontrolled hypertension, recurrent bilateral leg weakness and hypokalemia. He had gynecomastia on physical examination without signs of hypercortisolism. Plasma aldosterone concentration and aldosterone/renin ratio were elevated. Adrenal CT scan revealed a 4.7 cm x 4.1 cm x 4.8 cm left adrenal mass with enhancement features suggestive of a lipid-poor adenoma. Hormonal evaluation showed hypercortisolism and elevated estradiol. He underwent laparoscopic adrenalectomy. Histopathologic diagnosis was adrenocortical carcinoma based on Weiss criteria and immunohistomorphology with Ki67 index of 5-10%. After complete surgical resection, his blood pressure, aldosterone, cortisol and estradiol levels returned to normal.

**Conclusion:** In the work up of suspected adrenal carcinoma, complete hormonal evaluation is necessary even if clinical symptoms are absent. The pattern of tumor secretion and tumor characteristics on CT scan may point to the malignant potential of the tumor. Complete surgical resection is the cornerstone of treatment. Ki67 index is the most powerful prognostic marker and used to guide treatment decisions. Long-term monitoring is recommended with imaging and hormonal evaluation used as tumor markers for recurrence.
P10
Eligibility for Statin Therapy According to New Cholesterol Guidelines on Primary Aldosteronism: A Multicenter Longitudinal Cohort-based Study

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Objective: The recommendation for statin therapy for the prevention of cardiovascular disease is expanded in the 2013 guidelines of the American College of Cardiology and the American Heart Association (ACC/AHA). However, research focused on primary aldosteronism (PA) with high cardiovascular events in the different guidelines has not been documented.

Methodology: A total of 1,197 patients with hypertension and documented confirmatory tests were recorded from January 2007 to December 2013. The relationship between every aldosterone level and different guidelines was analyzed using a generalized additive model (GAM).

Results: We enrolled 461 patients in the PA group (44.9% male gender, mean age 57.4 ±8.4 years) and 553 control subjects in the essential hypertension (EH) group (49.9% male gender, mean age 57.0 ±9.5 years). Ten-year CV risk categories using the 2013 ACC/AHA guidelines showed that estimated 10-year CV risk more than 7.5% was lower in EH than PA. Under ACC/AHA guidelines, the percentage of additional participants (43.8%) with EH recommended for statin therapy was lower than adults with PA (47.3%) (p<0.01). Furthermore, GAM plot for high levels of aldosterone were more likely given lipid-lowering therapy in ACC/AHA guidelines than previous Adult Treatment Panel III guidelines.

Conclusion: Elevated aldosterone levels are associated with intensive statin prescription in PA according to the ACC/AHA guidelines. Among the components of the metabolic syndrome, lower HDL-C and higher LDL-C were prevalent in PA patients. Compared to the EH group, a higher proportion patients with PA were given statin therapy based on ACC/AHA guidelines.

P12
Evolving Clinical Presentation and Assessment of Pheochromocytoma

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Pheochromocytoma is a neuroendocrine lesion in the adrenal medulla composed of chromaffin cells producing excess amounts of catecholamines. These tumor cells have the property to synthesize, metabolize, store and secrete catecholamines and their metabolites. Clinical symptomatology is derived from the peripheral tissue effect of norepinephrine, epinephrine and their by-products. Morbidity and mortality is increased due to delay in diagnosis and treatment. A high index of suspicion leads to testing for pheochromocytoma through biochemical, imaging and genetic studies. Dilemmas in assessment arise when the clinical picture is affected by periodicity in catecholamine secretion, too little catecholamine secretion, lesions less than 1 cm, exclusively dopamine-secreting tumors and the unavailability of biochemical tests and imaging procedures.

In this review, we discuss the progress in the approach to early diagnosis of pheochromocytoma through improved clinical and biochemical assessment. Emphasis is made on the early recognition of evolving clinical presentations, with the introduction of cardiovascular imaging, 2D echocardiogram and cardiac MRI in the early diagnosis of patients with no risk factors, with equivocal biochemical and imaging results yet presenting with cardiovascular events. An algorithm is presented as an easy guide for clinicians.
P13
Adrenal Cavernous Hemangioma with Hormonal Hypersecretion: A Case Report
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Introduction: Cavernous hemangiomas of the adrenal gland are rare, with vague presentation and incidental discovery through imaging. The first cavernous hemangioma of the adrenal gland was surgically removed in 1955. Since then, only 63 cases have been reported and only 3 were functional.

Case: A 49-year-old hypertensive male on triple anti-hypertensive medication consulted for an incidental ultrasound finding of a 8.9 cm x 9.5 cm x 8.5 cm heterogeneously enhancing left suprarenal mass during a routine medical examination. CT scan showed an 8.9 cm left adrenal mass suspicious for adrenocortical carcinoma. Plasma aldosterone, renin, potassium, sodium, dexamethasone suppression test and DHEAS were unremarkable, but 24-hour urine metanephrine was elevated. He underwent laparoscopic resection of the left adrenal gland. Histopathology revealed cavernous hemangioma. Postoperatively, blood pressure was controlled at 120 to 130/80 on nebivolol. He was discharged stable after two days.

Discussion: Adrenal incidentaloma is present in up to 10% of patients imaged for non-adrenal disease. Functioning tumors and carcinomas account for around 4%. Adrenal hemangiomas are rare, benign vascular malformations which are usually non-functional and mostly cavernous, unilateral lesions. These are usually seen between the ages of 50 and 70 years, with a 2:1 female to male ratio. The tumors are usually >10 cm when discovered because they are usually incidental and asymptomatic. Surgical resection is necessary due to their propensity to bleed and the inability to rule out malignancy.

Conclusion: Adrenal cavernous hemangioma should be considered in the differential diagnosis of adrenal incidentaloma. The presence of hormonal hypersecretion does not exclude its diagnosis. The treatment is surgical removal.

P14
Clinical Characteristics of Elderly Hip Fracture in Lerdsin Hospital
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Objective: The worldwide incidence of fragility fracture is increasing, as is also seen in Thailand. Hip fractures are associated with increasing disability, morbidity and mortality, particularly within one year after fracture. Awareness and identification of the causes of osteoporosis are essential in management and prevention. We sought to evaluate clinical characteristics and risk factors of elderly osteoporotic hip fractures in Lerdsin Hospital, Bangkok, Thailand.

Methodology: Descriptive cross-sectional study

Results: A total of 116 elderly osteoporotic fracture patients who were admitted to the Orthopedic Department at Lerdsin Hospital from 1 June 2016 to 31 May 2017 were identified. There were 84 female patients (73.68%). The average age was 75.47 years (males 79.83 years, female 75.71 years). One hundred patients (86.2%) had medical conditions, including hypertension (69%), diabetes (36.2%), cerebral disease (13.8%) and cardiovascular disease (12.9%). Baseline laboratory for evaluation showed no significant abnormalities. Interestingly, 82% of patients had low vitamin D level (reference value <30 ng/mL), with an average of 23.5 ng/mL.

Conclusion: Elderly people, particularly postmenopausal women, have a high risk for hip fracture. Awareness and identification of the causes of osteoporosis, especially low vitamin D levels, are important in preventing future fractures.
P15
Successful Treatment of Recurrent Secondary Hyperparathyroidism with Forearm Autotransplanted Parathyroidectomy

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Secondary hyperparathyroidism is a significant disorder often found in patients with renal failure. Despite advances in its medical management, patients with severe and complicated renal hyperparathyroidism refractory or intolerant to medical therapy require parathyroidectomy. It is well known that a total parathyroidectomy and autotransplantation yield good results, but 1.5 to 10% of surgically treated patients may have persistent or recurrent disease because of hyperfunction of the parathyroid remnant or transplanted parathyroid tissue.

A 58-year-old woman presented with bilateral hip pain in the last 6 months. She was diagnosed with ESRD in 1996 and subsequently maintained on hemodialysis 3 times a week. In 2007, she presented bilateral hip pain, with note of increased calcium (10.3 mg/dL) and parathyroid hormone (2.085 pg/mL) levels. A diagnosis of secondary hyperparathyroidism was established. In 2009, the patient underwent total parathyroidectomy and parathyroid gland autotransplantation at the left forearm. On this admission, diagnostic tests revealed markedly elevated PTH (1,110 pg/mL). Based on the patient’s presentation and diagnostic tests, she was assessed to have recurrent secondary hyperparathyroidism with severe symptomatic high-turnover bone disease. Surgical removal of the autotransplanted parathyroid gland (2 cm) was performed.

Histopathology revealed parathyroid hyperplasia. Postoperatively, she developed hungry bone syndrome, which was managed successfully with intravenous calcium. One week after surgery, she was discharged on oral calcium and vitamin D.

P16
Incidental Finding of Bony Metastatic Disease Secondary to Bronchial Adenocarcinoma in a Patient with Paget’s Disease of the Bone

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Paget’s disease of the bone is a chronic progressive disease characterized by an increase in bone resorption, followed by a disorganized and excessive formation of new bone. The occurrence of Paget’s disease of the bone and bony metastases from adenocarcinoma of the lung in the same patient is uncommon.

We report a 69-year-old lady with known T2DM who complained of intermittent left hip pain for the past 3 years. Clinical examination including that of the hip joints were unremarkable. Biochemical tests revealed normal serum calcium and phosphorus, with markedly raised alkaline phosphatase. X-ray of the hip revealed diffuse sclerotic left pelvic bone. MRI of the hip revealed extensive marrow signal abnormalities at the left pelvic bone. Histopathology of bone biopsy of the left iliac bone was consistent with Paget’s disease of the bone. CT of thorax, abdomen and pelvis revealed a spiculated lung nodule at the left lower lung lobe. CT-guided biopsy of the mass revealed adenocarcinoma of the lung. 18F-FDG PET-CECT scan for staging evaluation showed intense tracer uptake in the left lower lobe of the lung with multiple mediastinal lymph nodes as well as right sacral bone, right ilium and bodies of L3 to L5 suggestive of new bony metastases. However, there was normal uptake in the left ilium. She was started on intravenous zoledronic acid as treatment of Paget’s disease. In view of the stage 4 lung adenocarcinoma with bony metastases, she was scheduled for palliative chemotherapy.
P17
Hypercalcemic Crisis Secondary to a Parathyroid Hormone-Secreting Neuroendocrine Ovarian Tumor

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Case: A 45-year-old woman was transferred to our institution following a five-day history of increasing weakness, lethargy, fever, disorientation and incoherence after falling out of bed.

She was seen weak, delirious and febrile. There was note of a palpable, firm, non-tender hypogastric mass. Laboratory tests showed severe persistent hypercalcemia (17.24 mmol/L and 16.6 mmol/L), hypokalemia (3.3mg/dL), hypomagnesemia (1.22 mg/dL), elevated creatinine (1.52 mg/dL) and markedly elevated intact PTH (306.7 pg/mL). She was adequately hydrated, given calcitonin and cinacalcet, and eventually underwent hemodialysis. Ultrasonography of the neck and thyroid were unremarkable. Sestamibi scan was negative for a parathyroid adenoma. CT scan of the whole abdomen showed heterogeneously enhancing foci within the uterine wall: 2.8 cm x 5.2 cm in the posterior wall, 1.8 cm x 2.5 cm in the anterior wall and a 2.9 cm x 2.4 cm hypoenhancing focus in the cervical region. There were heterogeneously enhancing masses noted in the bilateral hemipelvis. The patient underwent extrafascial hysterectomy, bilateral salpingo-oophorectomy, bilateral lymphadenectomy and omentectomy. PTH levels were monitored pre-operatively (326.89 pg/mL), 6 hours post-operatively (78.375 pg/mL) and 24 hours post-operatively (77.0 pg/mL). Histopathologic examination revealed large cell neuroendocrine carcinoma involving the right and left ovary with metastasis to the myometrium, and well differentiated endometrial adenocarcinoma. Post-operatively, chemotherapy with carboplatin and paclitaxel was started.

Conclusion: These results demonstrate the ectopic production of intact PTH by a neuroendocrine tumor and indicate a rare neoplastic cause of hyperparathyroidism.

P18
Fracture Prevention Clinic at Yangon General Hospital (YGH): A 6-month Review

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Introduction: One in 3 women and 1 in 5 men over the age of 50 suffer from osteoporotic fractures worldwide. Around 80% of these patients are not screened and treated appropriately. In 2016, 177 women and 132 men were admitted to YGH with hip fractures. This signified that preventive measures should be implemented to assess osteoporosis and treat it accordingly. YGH commenced a weekly Fracture Prevention Clinic in November 2017, organized by the Department of Diabetes and Endocrinology in collaboration with Orthopaedics and Rehabilitation Medicine.

Objective: To improve recognition and management of osteoporosis

Methodology: A 6-month prospective data collection was performed from January 2017 following a new referral pathway. Regular education sessions were delivered to promote the clinic and raise awareness.

Results: A total of 99 new patients were seen in clinic, consisting of 85 women and 14 men. Fifty nine percent were from the ages 51 to 70, and 24% were over 70 years. The primary sources of referral were from Rehabilitation Medicine (39%), Endocrinology (21%) and General Medicine (12%). The most common risk factors were prior fracture (41%), thyroxine/steroid use (26%) and history of inactive lifestyle/falls (24%). Smoking and alcohol intake were infrequent risk factors (1% and 2%, respectively). Of the consults, 74% were diagnosed with osteoporosis and 19% with osteopenia. Among these, 31% were investigated for secondary causes. Standard treatment was with alendronic acid and calcium with vitamin D supplements.

Conclusion: To reduce the health and economic burden of osteoporosis, improving recognition and management are essential. Hospital clinical practice guidelines have been produced to reinforce the institution’s motivation to improve osteoporosis care.
Hypercalcemia, Hypercalciuria, Nephrolithiasis, Elevated Serum 1, 25(OH)2 Vitamin D Levels in a Patient with Mutation in CYP24A1 Gene

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Introduction: Hypercalcemia with nephrolithiasis due to a mutation in the CYP24A1 enzyme has rarely been described. Failure to recognize the diagnosis can lead to recurrent nephrolithiasis and eventually renal failure. We describe a patient with nephrolithiasis and CYP24A1 mutation.

Case: A 21-year-old male was evaluated for recurrent nephrolithiasis. Physical examination was normal. Laboratory tests revealed elevated levels of serum calcium (11.1 mg/dL, reference value 8.6-10.2 mg/dL), ionized calcium (5.7 mg/dL, reference 4.5-5.6 mg/dL), 24-hour urine calcium (416 mg/24 hours, reference 100-300 mg/24 hours), 1,25(OH)2 vitamin D (74 pg/mL, reference value 18–72 pg/mL) and 24-hour urine uric acid (797 mg/24 hours, reference value <750 mg/24 hours). Other tests included 25(OH) vitamin D (53 ng/mL, reference 30–100 mg/mL), PTH (8.6 pg/mL, reference 15-65 pg/mL) and 24-hour urine citrate (467 mg/24 hours, reference 320–1240 mg/24 hours). Abdominal CT scan revealed multiple renal stones and nephrocalcinosis. Renal biopsy showed chronic tubulo-interstitial changes. Serum 24,25(OH)2 vitamin D was found to be low (0.31 ng/mL, reference 3.5 ± 1.6 ng/mL) when 25(OH) vitamin D levels were within 15-50 ng/mL. Genetic analysis of CYP24A1 showed a homozygous mutation E143del. Although ketoconazole is effective in this disorder, our patient refused to take the drug. He was placed on a low calcium (<400 mg/day), low purine diet, and advised high fluid intake.

Discussion: CYP24A1 encodes for the 24-hydroxylase enzyme, which regulates 1,25-dihydroxyvitamin D3. A mutation can result in elevated serum calcium levels due to increased renal and gastrointestinal calcium absorption. A mutation in CYP24A1 should be considered in the context of unexplained hypercalcemia associated with elevated 1,25(OH)2 vitamin D level and nephrolithiasis.

Primary Thyroid Lymphoma Initially Presenting as Atypical Follicular Cells of Undetermined Significance on Fine Needle Aspiration Biopsy: A Case Report

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Introduction: Primary thyroid lymphoma is a rare clinical entity occurring predominantly in elderly females. This uncommon thyroid malignancy continues to produce diagnostic dilemmas.

Objective: To discuss the signs and symptoms of primary thyroid lymphoma as well as the approach to diagnosis.

Case: We report a case of a 66-year-old female presenting with a five-month history of an anterior neck mass, initially about the size of a marble, located on the left side of the neck. In the interim, there was a rapid, diffuse enlargement of the mass occupying the entire neck, producing compressive symptoms of dysphagia, difficulty breathing and hoarseness. Initial thyroid ultrasound showed an enlarged thyroid gland, predominantly on the left lobe; and multiple solid and cystic nodules with a dominant nodule on the isthmus. Fine needle aspiration cytology of the thyroid then revealed atypical follicular cells of undetermined significance. Thyroid function tests were normal. Neck CT scan on follow up showed progressive increase in the size of the anterior neck mass. Core needle biopsy of the thyroid showed atypical lymphoid proliferation with immunohistochemical stains supporting the diagnosis of large B-cell lymphoma. The chest, abdomen and bone marrow were also evaluated for possible sources of neoplastic foci yielding unremarkable results.

Conclusion: Although rare, there should be a high index of suspicion for primary thyroid lymphoma with B-cell origin in patients with rapidly growing thyroid mass causing compressive symptoms.
**P22**

**Thyroid Hormone Resistance and Its Diagnostic Challenges**

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**Introduction:** Resistance to thyroid hormone (RTH) is a rare condition in which the responsiveness of end organ tissue to thyroid hormone is reduced. We hereby describe a case outlining the diagnostic challenges and add to existing literature.

**Case:** A 42-year-old female first presented with chronic fibromyalgia, occasional palpitations and mild heat intolerance. She had normal BMI, appeared clinically euthyroid and had no goiter. Her pulse rate was normal at 80 beats per minute. Thyroid function test (TFT) showed elevated FT4 (25 pmol/L, reference value 8-21 pmol/L) and FT3 (6.5 pmol/L, reference value 3.5-6.0), with an inappropriately normal TSH (1.68 U/L, reference value 0.35–5.6 U/L). Repeated thyroid tests showed similar results on 3 different laboratory platforms. Her lipid profile and sex hormone binding globulin (SHBG) (58 nmol/L) were normal. Although magnetic resonance imaging of her pituitary gland showed a 7 mm microadenoma, the rest of the pituitary hormones were normal. T3 suppression test was also partially suppressed. Finally, patient’s daughter’s TFTs were similarly abnormal, with an elevated FT4 (30.4 pmol/L) and normal TSH (1.26 U/L). She was diagnosed to have thyroid hormone resistance and treated symptomatically.

**Conclusion:** The diagnosis of RTH as well as TSH-producing adenoma should be considered when TFTs are discordant. In the absence of genetic testing, the diagnosis is clinched clinically with supporting investigations, such as similar thyroid profile in first degree relatives, partially suppressed T3 levels on suppression and normal SHBG levels.

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**P23**

**Bridge over Troubled Waters: Therapeutic Apheresis in a Patient with Thyrotoxicosis with Severe Hepatic Complications and Liver Cirrhosis from Chronic Hepatitis B Infection**

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Thyroid storm is an endocrine emergency with high mortality. Plasmapheresis at usual volumes of 40 to 60 mL/kg is described in case reports as a treatment option for thyroid storm where thionamides are contraindicated.

We report a case of a 32-year-old Filipino female admitted at our institution for abdominal pain. She was known to have Graves’ disease and chronic hepatitis B infection. She was managed as a case of thyroid storm and acute liver failure from hyperthyroidism on top of liver cirrhosis from chronic hepatitis B with high infectivity. The liver failure prevented the service from giving thionamides. One session of plasmapheresis with fresh frozen plasma performed at low volume (30 mL/kg) due to recent hypotension led to a rapid decline in thyroid hormones and antibodies: 86% in FT3, 3% in FT4, 25% in anti-Tg and 17% in anti-TPO 6 hours after the procedure. This was associated with rapid clinical improvement of her thyrotoxic symptoms. AST also dropped by 74% and ALT by 56%. The effect lasted biochemically for 24 hours and clinically for 6 days. Hepatitis B infection was simultaneously treated with Tenofovir.

Co-existing liver disease complicates the treatment of thyroid storm. Low volume plasma exchange is a viable temporizing measure to rapidly achieve decline in thyroid hormones among patients with thyroid storm for which thionamides cannot be administered and for which usual volume plasma exchange may be deemed unsafe. Early definitive treatment with thyroidectomy or radioactive iodine is recommended for Graves’ disease patients with concomitant liver disease.
**P24**

**Human Leukocyte Antigen (HLA)-G Gene Regulatory Region Polymorphisms in Patients with Papillary Thyroid Carcinoma**

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**Objectives:** Considering that HLA-G is an immune checkpoint molecule that is expressed in specimens of papillary thyroid carcinoma (PTC), we evaluated the genetic diversity of HLA-G gene regulatory regions in patients with PTC and its association with clinical and pathological features.

**Methodology:** Polymorphic sites at HLA-G gene regulatory regions [5' upstream regulatory region (5'URR) and 3' untranslated region (3'UTR)] were characterized by Sanger sequencing analyses in blood samples of 118 patients with PTC and 157 healthy controls and analyzed as haplotypes.

**Results:** Considering HLA-G 5'URR, patients with PTC exhibited higher frequency of the G010101a (*p*=0.0010) and G010101d (*p*=0.0403) haplotypes compared to controls. On the other hand, the G0104a haplotype was underrepresented in PTC (*p*=0.0007). The G0104a haplotype was more frequent in PTC patients with tumors size ≥2 cm (*p*=0.0476), as compared to tumors <2 cm. The G010101d haplotype was significantly more frequent in PTC patients who presented with extrathyroidal extension of the tumor (*p*=0.0192), while G010102a haplotype was less frequent (*p*=0.0192). The G010101f haplotype was more frequent in PTC patients who presented with advanced disease stage at diagnosis (*p*=0.0476). Regarding HLA-G 3'UTR, patients with PTC exhibited higher frequency of UTR-1 (*p*=0.0137) and UTR-6 (*p*=0.0172) compared to controls, while UTR-3 haplotype was less frequent (*p*=0.0255). Furthermore, UTR-3 haplotype was more frequent in PTC patients with tumor size ≥2 cm (*p*=0.0298) compared to tumor size <2 cm.

**Conclusion:** Regulatory region polymorphisms associated with increased HLA-G production were also associated with more severe PTC manifestations.

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**P25**

**Severe Methimazole-Induced Hepatotoxicity Complicated by Renal Failure and Sepsis**

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**Introduction:** Methimazole is associated with fewer incidences of adverse reactions compared to propylthiouracil, making it the drug of choice for hyperthyroidism. However, severe and fatal methimazole-induced liver injury does occur, particularly in the presence of underlying liver disease.

**Case:** A 54-year-old female with Graves’ disease was supposedly scheduled for radioactive iodine ablation when she developed panophthalmitis. Atrial fibrillation was noted on electrocardiogram with markedly elevated FT4 and suppressed TSH levels. Methimazole was resumed at 40 mg per day. Orbital CT scan showed no evidence of thyroid ophthalmopathy. Echocardiography showed no valvular abnormalities. Panophthalmitis and thyrotoxicosis eventually resolved. Two weeks later, she developed fever, epigastric pain, vomiting, thrombocytopenia and leukopenia, prompting discontinuation of methimazole. Five days after stopping methimazole, she developed encephalopathy, jaundice, coagulopathy and renal failure for which she underwent hemodialysis. Holoabdominal ultrasound showed normal liver, bile ducts and gallbladder, and normal renal sizes with signs of parenchymal disease and poor cortico-medullary differentiation. She tested negative for hepatitis infection. She developed hospital-acquired pneumonia from a multi-drug resistant organism (*Acinetobacter baumanii*) and eventually succumbed to septic shock. Post-mortem examination of the liver revealed canalicular cholestasis, microvesicular steatosis and portal triaditis consistent with drug-induced liver injury. No evidence of vasculitis or allergic interstitial nephritis was noted.

**Conclusion:** Methimazole can cause severe hepatotoxicity even in the absence of underlying liver disease and even after stopping the medication. Factors other than direct liver injury may be responsible for this latency that needs further investigation.
P26  
Concurrent Abdominal and Thyroid Lymphoma: A Case Report

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Objective: Diffuse large B-cell lymphoma (DLBCL) rarely presents as a thyroid mass. In this article, we present a case of DLBCL presenting with concurrent thyroid, abdominal and retroperitoneal involvement. We also review the epidemiology, pathophysiology and treatment of thyroid lymphoma.

Methodology: A literature search was conducted using PubMed and Google Scholar databases for primary thyroid lymphoma and extra-nodal lymphoma involving the thyroid. Publications were selected based upon size of patient cohorts, treatment modalities investigated, quality of the data and subsequent citation frequency. Articles most recently published and therefore subsuming the post-rituximab era were favored.

Results: Thyroid lymphoma in the presence of concurrent abdominal disease usually presents with goiter with or without symptomatic hypothyroidism and some combination of early satiety, dysphagia, dyspepsia or weight loss. Disease limited to the thyroid is typically treated with surgery and/or radiation, while extensive disease is typically treated with chemoimmunotherapy. The shared embryologic origin between lymphocytes in the thyroid and those in the abdomen may contribute to simultaneous development of lymphoma in the setting of autoimmune lymphocytic thyroiditis and resulting alterations in systemic cytokines. In this case, the patient had a complete response to chemoimmunotherapy and remains in remission.

Conclusion: This case highlights an unusual presentation of concurrent abdominal and thyroid DLBCL. Higher stage disease portends a worse prognosis, though our patient is without evidence of residual disease two years from diagnosis.

P27  
Apathetic Thyroid Storm with Resultant Hypercalcemic Crisis: A Rare Presentation of a Common Condition

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Thyroid storm is a severe and life-threatening form of thyrotoxicosis, characterized by features such as hyperthermia, arrhythmias, gastrointestinal disturbances and altered mental status. Rarely, patients can present in an apathetic form where negative or passive symptoms such as body weakness, lethargy and depression predominate, causing diagnostic challenges. In this case report, we present a 64-year-old lady with a 2-week history of lethargy, generalized body weakness, fever, cough and decreased mentation. On examination, she appeared lethargic and ill with tachycardia (130 beats per minute). Other physical examination findings were generally unremarkable. Further investigation excluded structural intracranial lesions, but her laboratory findings were consistent with thyroid storm (TSH <0.005 mIU/L, FT4 >100.0 pmol/L) and hypercalcemic crisis (corrected serum calcium 4.02 mmol/L). Her hypercalcemic crisis was initially managed with pamidronate, which subsequently caused transient hypocalcemia necessitating both oral and intravenous calcium supplements. Thyroid storm was treated with hydrocortisone, Lugol’s iodine and anti-thyroid medications together with other supportive measures, with marked clinical improvement and normalization of laboratory indices. Further tests such as tumor markers and computed tomography scan were negative for malignancy. Intact parathyroid hormone (iPTH) level was normal at 21 pg/mL. Concomitant apathetic thyroid storm and hypercalcemic crisis is a rare manifestation of thyrotoxicosis, a rather common medical condition. Early recognition and prompt treatment is vital for better patient outcome.
**P28**

**A Rare Case of Lingual Thyroid Associated with Graves’ Disease**

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Ectopic thyroid tissue is a rare disease entity occurring in approximately 1 in every 100,000 individuals, with a preponderance for females. Majority of patients present with a lingual thyroid and are asymptomatic. However, when clinically apparent, it commonly manifests with symptoms of compression or hypothyroidism. Hyperthyroidism in these rare cases is an unusual finding with few published reports. At present, no consensus for the management of these cases has been formulated. We present a case of a 40-year-old female who sought consult for a progressively enlarging submental mass associated with weight loss, palpitations, tremors and heat intolerance. Thyroid function tests revealed low TSH and elevated FT4 levels. She also tested positive for TSH receptor antibodies. Ultrasonography showed an empty thyroid bed, while thyroid scan showed diffuse tracer uptake in the midline submandibular area. She was diagnosed as a case of lingual thyroid with Graves’ disease. She was subsequently managed with radioactive iodine therapy with resolution of hyperthyroid symptoms.

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**P29**

**Age and Gender Differences in Relationship between Thyroid Dysfunction and Dyslipidemia: Based on Korea National Health and Nutrition Examination Survey 2013-2015**

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**Objective:** The role of thyroid hormones on lipid metabolism is widely recognized. However, there is no evident data to explain the real relationship between thyroid dysfunction and lipid profiles according to age and gender.  

**Methodology:** We analyzed the association between thyroid dysfunction and lipid profiles, such as total cholesterol (TC), low density lipoprotein cholesterol (LDL-C), triglyceride (TG) and high-density lipoprotein cholesterol (HDL-C), based on a nationwide, cross-sectional survey of the general Korean population, the Korean National Health and Nutrition Examination Survey 2013-2015. Data from a total of 4,242 participants (representative of 8,297,101 age 30 to 70 without previous history of thyroid disease or taking medication for dyslipidemia were analyzed.  

**Results:** Thyroid dysfunction was significantly different according to TC ($p<0.001$) and LDL-C ($p=0.009$) but not TG ($p=0.078$) and HDL-C ($p=0.127$). Subgroup analysis revealed a significant association for women only ($p$ values for TC=$0.012$, LDL-C=$0.006$, TG=$0.108$ and HDL-C=$0.248$). We performed further subgroup analysis of the female population according to age and found that thyroid dysfunction was significantly different according to lipid profiles in younger (age < 55 years) ($p$ values for TC=$0.026$, LDL-C=$0.005$, TG=$0.030$ and HDL-C=$0.031$), but not in older women (age ≥ 55 years).

**Conclusion:** The relationship between thyroid dysfunction and dyslipidemia was evident only in women younger than 55 years. Age and gender should be considered when screening for thyroid function in subjects with dyslipidemia.
Primary Tuberculosis of the Thyroid Gland: A Case Report

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Introduction: Tuberculosis of the thyroid gland affects about 0.1% of patients with TB. It is rare even in regions where tuberculosis is endemic. We sought to discuss the signs and symptoms of thyroid tuberculosis as well as its diagnosis, treatment and disease course.

Case: We report the case of a 60-year-old male who presented with painful, progressively enlarging marble-sized thyroid nodules for 1 month accompanied by occasional low-grade fever, weakness and weight loss. He had no history or evidence of pulmonary tuberculosis. Aspiration cytology of the nodules revealed polymorphic lymphoid cells with occasional giant cells consistent with granulomatous thyroiditis. There was a substantial decrease in pain severity within 2 to 3 weeks of starting anti-Koch’s therapy. After completion of 6 months of treatment, repeat ultrasonography showed a decrease in size and number of nodules.

Conclusion: Though rare, tuberculosis should be considered as a differential diagnosis in patients presenting with painful thyroid nodule(s) even in the absence of a history of tuberculosis, and especially where the prevalence of tuberculosis is high. This case, similar to other cases reported, was very responsive to a short course of anti-Koch’s regimen.

Plasma Exchange as a Novel Treatment Strategy in a Thyrotoxic Patient with Drug-Induced Pancytopenia and Stroke who Subsequently Underwent Thyroid Surgery

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This report gives an account of the utility of plasmapheresis in treating a patient with thyroid storm and drug-induced pancytopenia, to bridge a euthyroid state prior to thyroidectomy. A 77-year-old man presented with a 15-year history of hyperthyroidism from Graves’ disease with opthalmopathy, treated with methimazole, azathioprine and prednisone. He was admitted for sore throat, fever and cough. He was treated for drug-induced pancytopenia, febrile neutropenia, pneumonia and herpetic ulcers. In the interim, he developed dyspnea, leg edema, and tachycardia that evolved into atrial fibrillation, necessitating transfer to the ICU for ventilatory support. Pertinent results showed significant progression of bilateral reticulonodular and hazy opacities on chest X-ray, elevated FT3 (5.58 pg/mL) and FT4 (4.55 ng/dL) levels, and suppressed TSH (0.046 uIU/mL). Anti-thyroid receptor antibodies (TRAb) were elevated (6 U/L) (reference value <1 U/L). He also developed an acute stroke with left hemiplegia and anisocoria, seen as an infarct on the right frontotemporaparietal areas on CT scan. He underwent plasma exchange for 6 sessions with significant reductions in FT4 (1.21 ng/dL), FT3 (2.4 pg/mL) and TRAb (0.37 U/L) levels. Blood indices improved and his condition stabilized. He subsequently underwent total thyroidectomy, tracheostomy and percutaneous endogastric tube insertion, and was eventually weaned from the ventilator. Ultimately, he was discharged from the hospital. In this successful case management, plasmapheresis normalized thyroid hormone levels and decreased levels of autoantibodies. Plasma exchange may be used as an alternative modality for drug-induced pancytopenia and preoperative management for thyroidectomy due to life-threatening thyrotoxicosis.
P34
Papillary Thyroid Carcinoma Presenting as Cystic Nodule: A Case Report

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Introduction: Cystic nodular disease is a rare presentation of papillary thyroid carcinoma, as it is seen in only less than 10% of confirmed PTC. We present an unusual case of a 45-year-old male, with no predisposing factor, who presented with a large right colloid goiter that was later confirmed by immunohistochemical staining to be papillary thyroid carcinoma.

Case: The patient initially consulted for an incidental finding of a right thyroid nodule on palpation. Pertinent work up revealed normal baseline thyroid function tests and a ~3 cm right ovoid thyroid cystic mass with multiple small nodules but no suspicious findings suggestive of malignancy on ultrasonography. Fine needle aspiration cytology revealed blood and colloid (Bethesda Category I). Right thyroidectomy and eventual completion thyroidectomy were done.

Histopathologic examination revealed the right thyroid lobe had a 0.3 cm micro-papillary thyroid carcinoma and an adenomatous goiter with cystic degeneration and hyperplastic features which were suggestive of an underlying malignancy. HBME-1 stain for papillary thyroid carcinoma was positive.

Conclusion: The malignant potential of a cystic nodule should not be overlooked, as some papillary thyroid cancers may have cystic variants. Immunohistochemical stains such as HBME-1 are useful tests to help differentiate benign from malignant lesions, particularly those with equivocal histology, and should be considered in cases of large cystic nodules to rule out thyroid carcinoma.

P35
Hashimoto’s Thyroiditis Presenting as Unilateral Subacute Thyroiditis: A Case Report

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Introduction: Lymphocytic thyroiditis can present with a clinical course of subacute thyroiditis with unilateral decreased uptake on scintigraphy.

Case: We report the case of a 68-year-old woman with a clinical course of subacute thyroiditis, presenting with fever, lymphadenopathy, neck pain and a tender left anterior neck mass on examination. Thyroid ultrasonography done 5 weeks from onset of symptoms revealed a solid left thyroid mass, for which thyroidectomy was initially contemplated. She had normal thyroid function tests, anti-TPO and anti-thyroglobulin. Gray scale and color doppler ultrasound of the thyroid at the 8th week of illness revealed a large heterogeneous mass measuring 4.87 cm x 3.00 cm x 2.02 cm almost completely occupying the left thyroid lobe (lobe size was 5.54 cm x 2.25 cm x 2.01 cm). The left lobe was barely visualized by thyroid scintigraphy on the 10th week of illness. Thyroid uptake was decreased at 2 and 24 hours. Fine needle aspiration biopsy revealed findings consistent with lymphocytic thyroiditis. On clinical observation, at the 14th week of illness, the left thyroid mass and pain subsided, as the right thyroid lobe began to enlarge and also became painful and tender. The right thyroid mass and pain subsided and eventually resolved on the 18th week from onset of symptoms.

Conclusion: Hashimoto’s thyroiditis may present clinically as subacute thyroiditis with unilateral features on ultrasound and thyroid scan. Critical interpretation of clinical course, sonographic findings and thyroid scintigraphy are essential in the diagnosis.
P37
A Patient with Autoimmune Thyroiditis: From Hyperthyroid to Hypothyroid (Graves’ Disease into Hashimoto’s Thyroiditis?)

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We report the case of a 29-year-old male of Indian ethnicity who presented with intermittent sensation of warmth, sweating, and palpitations. He was diagnosed by a physician from his home country with Graves’ disease 3 years ago and was treated with carbimazole and propanolol. Three months ago, he was told that he had Hashimoto’s thyroiditis and was treated with levothyroxine at 50 μg/day. Physical examination revealed no remarkable abnormalities. Laboratory examination revealed slightly high FT4, and positive anti-Tg and anti-TPO antibodies. Ultrasonographic examination was read as suspicious for thyroiditis (Hashimoto’s?). He refused to have another ultrasonogram and fine needle aspiration biopsy. The patient was assessed to have suspected Graves’ disease which evolved into Hashimoto’s thyroiditis, on the basis of his initial hyperthyroid followed by hypothyroid presentation, and positive anti-thyroid antibodies. Differential diagnoses were slowly progressive Hashimoto’s Thyroiditis, from hyperthyroid followed by hypothyroid state, and Graves’ disease in hypothyroid state. He was treated with levothyroxine 25 μg/day and followed up for clinical and laboratory examination every 6 weeks.

P38
The Continuing Scourge of Melioidosis Infection among Patients with Poorly Controlled Diabetes Mellitus

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Case: A 66-year-old Chinese gentleman with known type 2 diabetes mellitus and chronic kidney disease Stage 5 (eGFR <15 mL/min/1.73m²) presented with intermittent fever and chills for one week. He had no recent travel history. He was on glipizide alone for his diabetes. Apart from high grade fever, the rest of his vital signs and physical examination were normal. Blood investigations revealed severe hyperglycemia (27.5 mmol/L), elevated glycated hemoglobin (8.8%), mild elevation of β-hydroxybutyrate (2.6 mmol/L), severe metabolic acidosis (bicarbonate 8 mmol/L) and left shift on full blood count. Chest radiograph did not reveal any infective process. He was commenced on intravenous insulin and intravenous ceftriaxone for broad spectrum coverage. Blood culture subsequently revealed growth of *Burkholderia pseudomallei*, prompting shift to intravenous piperacillin-tazobactam. Subsequent imaging revealed splenic abscesses. His blood glucose was optimized with regular subcutaneous biphasic insulin during his inpatient stay. He was discharged well after completion of 2 weeks of intravenous antibiotic treatment, followed by oral antibiotics for 10 weeks.

Conclusion: Melioidosis remains endemic in Singapore. Practicing physicians need to be aware of this potentially life-threatening condition and to adapt a lower threshold for commencing appropriate antibiotics in the treatment of patients with diabetes presenting with overt sepsis.
P39
Correlation between Shift Work Method and the Incidence of Metabolic Syndrome in Internal Medicine Ward Nurses at Prof Dr RD Kandou Hospital and Pancaran Kasih Hospital Manado

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Objective: Metabolic syndrome is the cluster of clinical manifestations and risk factors for various degenerative diseases. Work shifts could change the circadian rhythm of the body including the endocrine system. This research was meant to determine the correlation between work shift and the incidence of metabolic syndrome in nurses of internal medicine ward.

Methodology: We conducted a cross-sectional study using an analytic descriptive method. We recruited 38 nurses who met the inclusion criteria of male gender, age less than 45 years old, with one-year experience of work, no history of smoking and alcohol consumption, and willing to participate. Shift work entails 3 shifts with 8 hours work per shift for a day. In compliance with the IDF 2005 metabolic syndrome research data, parameters were measured using Riester Nova Ecoline® sphygmomanometer, Hexokinase for blood plasma glucose, Enzymatic Homogenus and Enzymatic colorimetry examination.

Results: Of the nurses in the shift work group, 16 (55.2%) met the criteria for metabolic syndrome. In the non-shift work group, 2 (22.2%) were found to have metabolic syndrome. Bivariate analysis showed no correlation between shift work and the occurrence of metabolic syndrome ($p=0.130$).

Conclusion: Metabolic syndrome was found more in the shift work group, but the difference was not statistically significant. Systolic blood pressure was the most frequently occurring component of metabolic syndrome.

P40
Poorly Controlled Blood Glucose in Acromegaly Patients

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Introduction: Acromegaly is caused by excessive secretion of growth hormone (GH) and the resultant persistent elevation of insulin-like growth factor (IGF-1) levels. The most common cause of acromegaly is a functioning pituitary adenoma. Diabetes mellitus is usually seen in acromegaly patients with insulin resistance.

Case: We encountered a 35-year-old woman admitted for control of glycemic state prior to surgery. She was known to have type 2 diabetes (FBS 287 mg/dL) and acromegaly on the basis of clinical features and elevated IGF-1 (916 ng/mL). She had normal liver and renal function. Screening tests showed normal GH, FSH, prolactin, cortisol and testosterone levels. She underwent transsphenoidal excision of the functioning pituitary tumor. A large amount of insulin (95 units/day) was required to control her blood glucose level. She was also treated with octreotide and somatostatin analogue. She was finally discharged from the hospital on a multiple daily injection regimen of insulin (total daily dose 84 units/day). After several months during reevaluation of acromegaly, the patient still had poorly controlled glycemia. Delay in the diagnosis in acromegaly aggravates complications due to GH hypersecretion, leading to further reduced insulin sensitivity. Poor nutrition status found to persist during follow up may also explain her poor glycemic control.
P41
Study on Serum Phospholipid Fatty Acid Composition in Newly Diagnosed Thai Type 2 Diabetes

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Objective: Recent reports indicate that alterations in plasma fatty acid composition by dietary lipids are associated with insulin resistance and T2DM. Calculated desaturase activities are proposed to be an emerging risk factor for metabolic syndrome. This study aimed to examine the pattern of fatty acid composition in serum phospholipids of newly diagnosed Thai T2DM compared with healthy controls.

Methodology: Sixteen newly diagnosed Thai T2DM (onset of diabetes ≤2 years) and 16 healthy controls were recruited. Fasting plasma samples were obtained to measure serum phospholipid fatty acid composition. Delta-9-desaturase (D9D) activities were calculated as the stearic/oleic ratio and palmitoleic/palmitic ratio. Delta-6-desaturase (D6D) activities were calculated as the ratio of γ-linoleic/linoleic and arachidonic/dihomo-gamma-linolenic (DGLA).

Results: Our data showed that serum free fatty acids were higher in T2DM, particularly palmitic, palmitoleic, oleic and DGLA. The activities of D9D (18:1/18:0), D9D (16:1/16:0) and D6D (18:3/18:2) in serum phospholipids were higher than in healthy controls. D9D (16:1/16:0) activity was correlated with fasting glucose ($r=0.390, p=0.030$), C-peptide ($r=0.419, p=0.019$) and glucagon ($r=0.422, p=0.018$) in newly diagnosed Thai T2DM, but not with insulin ($r=0.328, p=0.071$).

Conclusions: High concentrations of long-chain free fatty acid (16:0, 16:1, and 20:3n-6) along with increasing in activities of D9D and D6D were observed in newly diagnosed Thai T2DM patients. Whether these distinct changes reflect the potential role of some plasma fatty acid composition in the pathogenesis of Thai T2DM or merely the effects of dietary intake should be confirmed in future studies.

P42
Features of Insulin Autoimmune Syndrome after Simultaneous Diabetic Ketoacidosis and Thyroid Storm in a 49-year-old Filipino Woman

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A 49-year-old woman consulted the emergency department due to a one-day history of vomiting, undocumented fever, severe dyspnea and generalized body weakness. She was diagnosed with diabetes and treated with insulin since she was 33 years old. She was just recently diagnosed with Graves’ disease and treated with methimazole 3 months ago. She had erratic compliance with medications and no regular follow-up with her private physician. She was seen agitated, in respiratory distress, with altered mentation. Preliminary evaluation revealed tachycardia (140s beats per minute), acidemia (pH 7.1), critically high capillary blood glucose and features of dehydration. She was managed as a case of DKA with simultaneous thyroid storm (TS), with a Burch and Wartofsky score of 60. After a day in the ICU, DKA and TS improved, and insulin drip was shifted to once daily glargine and premeal glulisine as diet was resumed. However, the patient started to have spontaneous daily morning hypoglycemia from 70 mg/dL to below 10 mg/dL. Although initially thought to be caused by exogenous insulin, the hypoglycemia became persistent despite significant reduction in insulin doses and more frequent meals. This was accompanied by hyperglycemia in the evening, ranging from 300 to 500 mg/dL. Although insulin autoimmune syndrome was entertained with elevated insulin antibodies, the patient still had hypoglycemic episodes even with hydrocortisone. She was shifted from methimazole to PTU which decreased frequency of morning hypoglycemia, but she continued to have erratic glucose levels throughout the day.
**P43**

**Efficacy and Safety of Fast-Acting Insulin Aspart Maintained over 52 weeks: Comparison with Insulin Aspart in Onset 1**

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**Objective:** The aim of the additional 26-week period was to assess long-term safety and efficacy of faster insulin aspart.

**Methodology:** In the initial 26-week treatment period of onset 1, subjects were randomized to either double-blind mealtime fast-acting insulin aspart, insulin aspart or open-label post-meal fast-acting insulin aspart, each with once- or twice-daily insulin detemir. Subjects on mealtime fast-acting insulin aspart (n=380) and mealtime insulin aspart (n=381) then continued to the additional 26-week treatment period.

**Results:** After 52 weeks, mean HbA1c change from baseline was −0.08% with fast-acting insulin aspart and +0.01% with insulin aspart, with significant estimated treatment difference (ETD) favoring fast-acting insulin aspart (ETD −0.10%, 95% CI, −0.19 to −0.00). Following a standardized meal test, the change from baseline in 1-hour postprandial plasma glucose (PPG) increment significantly favored fast-acting insulin aspart (−1.05 mmol/L) compared with insulin aspart (−0.14 mmol/L). The improvements in postprandial plasma glucose (PPG) increment significantly favored fast-acting insulin aspart (ETD −0.23 mmol/L, 95% CI, −0.46 to −0.00), driven by 2-hour PPG increments after breakfast and dinner. At the end of the trial, median total insulin dose was 61.3 units/day or 0.77 units/kg with fast-acting insulin aspart, and 68.5 units/day or 0.83 units/kg with insulin aspart. After 52 weeks, the overall safety profiles, including adverse events, immunogenicity and standard safety parameters, were similar between fast-acting insulin aspart and insulin aspart, and as expected for insulin aspart.

**Conclusion:** These results are the first patient-reported dataset on hypoglycaemia in the participating countries and indicate that hypoglycaemia is under-reported and thus underestimated.

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**P44**

**Self-Reported Hypoglycaemia in Insulin-Treated Patients with Diabetes: Results from an International Survey of 7289 Patients from 9 Countries**

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**Objective:** The non-interventional International Operations Hypoglycaemia Assessment Tool (IO HAT) study assessed the incidence of hypoglycaemia in patients with insulin-treated diabetes in Bangladesh, Colombia, Egypt, Indonesia, the Philippines, Singapore, South Africa, Turkey and the UAE.

**Methodology:** The incidence of hypoglycaemia was reported in self-assessment questionnaires completed at baseline and after the 28-day prospective period, and inpatient diaries.

**Results:** Of 7289 patients (type 1 diabetes [T1D] n=1016, type 2 diabetes [T2D] n=6273), approximately 90% completed their diaries in the prospective period (28 days from baseline). At least 1 case of confirmed hypoglycaemia (capillary glucose <3.1 mmol/l) was recorded in patient diaries by 48.0% of patients with T1D and 12.6% of those with T2D.

Based on patient recall, severe hypoglycaemia was reported for the prior 6 months, and any hypoglycaemia the 4 weeks before baseline (Fig.1). Any hypoglycaemia was retrospectively reported by patients (T1D 72.7%, T2D 48.1%). Nearly all patients reported events during the prospective period (T1D 97.4%, T2D 95.3%). Rates of ‘any’ and ‘severe’ hypoglycaemia were higher in the prospective period (p<0.001) compared to those in the retrospective period for T1D and T2D. In contrast, lower rates of nocturnal hypoglycaemia were reported prospectively vs. retrospectively (p<0.001).

**Conclusion:** These results are the first patient-reported dataset on hypoglycaemia in the participating countries and indicate that hypoglycaemia is under-reported and thus underestimated.
**P45**

**Efficacy and Safety of Switching from Sitagliptin (SITA) to Liraglutide (LIRA) in Subjects with Type 2 Diabetes (T2D) Not Achieving Adequate Glycemic Control on SITA and Metformin (MET): A Post Hoc Subgroup Analysis Defined by Baseline (BL) BMI < or = 30 kg/m²**

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This post hoc subgroup analysis of the multinational, multicenter, randomized, double-blind, active-controlled Lira-SWITCH trial compared 26 wk efficacy and safety of switching from SITA to LIRA as add-on to MET in subjects with T2D not achieving adequate glycemic control on SITA + MET, in subjects with BL BMI < or 30 kg/m².

Subjects previously receiving SITA (100 mg/day) and MET for 90 days, were randomized 1:1 to switch to LIRA 1.8 mg (n=203) or continue SITA 100 mg/day (n=204), both + MET.

Switching to LIRA from SITA reduced A1c (BMI <30, EM wk 26 7.08 vs. 7.73% (ETD -0.66 [-0.99;-0.32]; \(p=0.0001\)); BMI 30, EM wk 26 7.07 vs. 7.65% (ETD -0.58 [-0.86;-0.30]; \(p<0.0001\))), body weight (BMI <30, EM wk 26 86.63 vs. 87.87 kg (ETD -1.24 [-2.31;-0.18]; \(p=0.0221\)); BMI 30, EM wk 26 86.50 vs. 88.22 kg (ETD -1.71 [-2.60;-0.82]; \(p=0.0002\))) and FPG (Table) significantly more than continuing SITA, in both BMI groups. There were no significant differences in ETDs between BMI groups for all parameters (\(p>0.05\)) except for FPG (\(p=0.024\)).

In conclusion, switching to LIRA resulted in superior A1c and body weight reductions compared with continued SITA treatment, regardless of BL BMI status, and there was no evidence of a different treatment effect between the two BMI groups.

**P46**

**Achieving FPG Target without Hypoglycemia: A Meta-Analysis of Insulin Degludec vs. Insulin Glargine**

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Insulin degludec (IDeg) is a basal insulin with a long and stable glucose-lowering effect and low day-to-day intra-patient variability compared with insulin glargine (IGlar). This meta-analysis investigated the proportion of patients meeting the laboratory-measured FPG target of <130 mg/dL (7.2 mmol/L), defined as the upper limit of the recommended premeal PG goal based on the 2015 ADA Standards of Medical Care in Diabetes, at each visit during the maintenance period, as well as doing so without experiencing nocturnal hypoglycemia. The maintenance period is defined as all visits from week 16 onwards. Nocturnal hypoglycemia was defined as any confirmed (BG <56 mg/dL [3.1 mmol/L]) self-monitored event occurring between 00:01 and 05:59, inclusive.

Patients (T1D or T2D) from seven open-label, randomized, treat-to-target trials treated with either IDeg (n=2501) or IGlar (n=1256) were included. Use of IDeg resulted in significantly more patients reaching the FPG target at each visit throughout the maintenance period, as well as doing so without experiencing nocturnal confirmed hypoglycemia, compared with IGlar. These results were similar across the three patient populations; T1D, T2D insulin treated and T2D insulin naïve. In conclusion, more patients treated with IDeg can achieve target FPG at repeated visits as well as without nocturnal confirmed hypoglycemia compared with IGlar.
**P47**

**Liraglutide and Renal Outcomes in Type 2 Diabetes: Results of the LEADER Trial**

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**Introduction:** The effects of liraglutide, a long-acting glucagon-like peptide-1 (GLP-1) analog, on renal outcomes in type 2 diabetes are unknown. We conducted a randomized, double-blind, placebo-controlled trial comparing liraglutide vs placebo, both on a background of standard of care, in participants with type 2 diabetes and high cardiovascular risk.

**Methodology:** The Liraglutide Effect and Action in Diabetes: Evaluation of cardiovascular outcome Results (LEADER) trial was initiated in 2010 and completed in 2015. Renal events were key secondary outcomes. The primary renal outcome was a composite of new onset of persistent macroalbuminuria, persistent doubling of serum creatinine, end stage renal disease (ESRD), or death due to renal disease. Risk of renal outcomes was determined using intention-to-treat in time-to-event analyses; competing risk of death was taken into account. Change of eGFR and loss of eGFR by >-30% was also analyzed.

**Results:** 9340 patients were randomized and median follow-up was 3.84 years. The primary renal outcome occurred in fewer participants treated with liraglutide (268 of 4668) than with placebo (337 of 4672; HR 0.787 [0.670;0.924] \( p=0.003 \)). The difference was primarily driven by new onset of persistent macroalbuminuria, occurring in fewer participants treated with liraglutide (161 of 4668) than with placebo (215 of 4672; HR 0.74 [0.61;0.91] \( p=0.004 \)). Doubling of serum creatinine and ESRD tended to be less frequent with liraglutide. eGFR decreased significantly less and albuminuria increased less with liraglutide than placebo.

**Conclusions:** In conclusion, liraglutide in addition to standard of care therapy reduced the progression of diabetic nephropathy.

**P48**

**Meta-Analysis comparing Hypoglycemia Rates of Insulin Degludec with Insulin Glargine across Clinical Trials with up to 2 years' Duration**

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Insulin degludec (IDeg), is a basal insulin with a long and stable glucose-lowering effect with low day-to-day variability. A comparison of the rate of hypoglycemia with IDeg vs. insulin glargine (IGlar) across phase 3a trials, including all available trial extensions (n=4) plus one new trial was performed post hoc; IDeg: n=3454; IGlar: n=1709; T1D: 2 trials; T2D: 6 trials. Hypoglycemia was defined as rates of self-reported confirmed hypoglycemia (BG <56 mg/dL or severe hypoglycemia requiring assistance) and nocturnal confirmed hypoglycemia (00:01-05:59 both incl.). Rates were analyzed with a negative binomial regression model on patient level data. IDeg resulted in statistically significantly lower rates of confirmed and nocturnal confirmed hypoglycemia vs. IGlar in T2D, and for nocturnal confirmed hypoglycemia in T1D. Analyses of the maintenance period (from 16 weeks onwards), demonstrated more pronounced benefits with IDeg vs. IGlar in both T1D and T2D. In conclusion, this post hoc meta-analysis confirms and extends the outcomes of a previously published pre-specified meta-analysis. Even with the inclusion of additional trial data for up to two years’ duration, the lower rates of both overall (T2D) and nocturnal confirmed (T1D and T2D, respectively) hypoglycemia with IDeg vs. IGlar are maintained.
**P49**

**Reaching Individualized FPG Targets without Nocturnal Hypoglycemia with IDegAsp BID vs BIAsp 30: A Meta-Analysis**

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ADA/EASD 2015 guidelines recommend personalized glycemic targets to balance benefits and risks (e.g. hypoglycemia) in individual patients. Assessing the likelihood of reaching glycemic targets without nocturnal hypoglycemia with different therapies may aid achievement of individualized targets.

The proportion of patients reaching fasting plasma glucose (FPG) targets (<90 mg/dL, <108 mg/dL or <126 mg/dL) without nocturnal hypoglycemia (00:01–05:59h inclusive) during the maintenance period (last 12 weeks of treatment) was assessed using data pooled from three 26-week, treat-to-target phase 3a/b trials of IDegAsp (a novel co-formulation of 70% insulin degludec [IDeg] and 30% insulin aspart [IAsp]) twice daily (BID) vs biphasic IAsp 30/70 (BIAsp 30) BID in the IDegAsp clinical development program (BOOST). Patients were insulin naïve (BOOST START TWICE DAILY) or switched from basal or pre-mix (BOOST INTENSIFY PREMIX I or INTENSIFY ALL).

End-of-trial A1C did not differ between IDegAsp and BIAsp 30 in the 3 trials. Patients were significantly more likely to reach all FPG targets without nocturnal hypoglycemia with IDegAsp vs BIAsp 30: the odds ratio ranged from 2.92 to 2.98 for all 3 FPG targets (p<0.0001 for all analyses)

Treatment with IDegAsp BID vs BIAsp 30 BID may help achieve personalized FPG targets without nocturnal hypoglycemia for a wide range of patients with T2D.

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**P50**

**Health Economic Impact of Hypoglycemia among 7,289 Insulin-Treated Patients with Diabetes: Results from an International Survey in 9 Countries**

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Objective: Hypoglycemia is a key consideration in the individualization of treatment in patients with diabetes.

Methodology: The International Operations (IO) Hypoglycemia Assessment Tool (HAT) study is a non-interventional, real-world, observational study of self-reported (using self-assessment questionnaires) hypoglycemic events in Bangladesh, Colombia, Egypt, Indonesia, the Philippines, Singapore, South Africa, Turkey and the UAE among 7,289 patients with insulin-treated type 1 (T1D) and type 2 diabetes (T2D).

Results: Rates of any hypoglycemia (per patient, per month) were 4.8 and 6.9 in patients with T1D and 1.6 and 2.4 in those with T2D during the retro- and prospective periods, respectively. For both patients with T1D or T2D, reporting of any and severe hypoglycemic events was significantly higher (p<0.001) in the prospective period, whereas that of nocturnal hypoglycemic events was significantly higher (p<0.001) in the retrospective period. The most common direct impact of hypoglycemia was increased blood glucose monitoring which occurred in 43.8% (T1D) and 20.0% (T2D) of patients in the 4-week prospective period. Other impacts included telephone contacts with a health care team member (6.4 and 5.9%, respectively), additional clinic appointments (5.8 and 4.3%) and post-hypoglycemic event hospital admissions (3.0 and 1.7%) in patients with T1D and T2D, respectively.

Indirect impact of hypoglycemia included reduced work/study punctuality (arriving late or leaving early) in patients with T1D (11.5 and 9.4%) and T2D (3.5 and 3.7%).

Conclusion: Hypoglycemia is a major concern in diabetes treatment and is not just a barrier to reaching appropriate glycemic targets, but also increases HE costs.
P51
Self-Reported Hypoglycemic Rates among 2594 Insulin-Treated Adult Patients with Diabetes: Results from IO HAT Study

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Objective: IO HAT study assessed incidence of hypoglycemia in insulin treated patients with T1D and T2D in 9 countries (Bangladesh, Colombia, Egypt, Indonesia, Philippines, Singapore, South Africa, Turkey and UAE). Here we report the results of the South East Asia cohort of IO HAT study.

Methodology: The incidence of any, severe and nocturnal hypoglycemia was assessed using two part self-assessment questionnaires (SAQs) and patient diaries. In SAQ1, retrospective hypoglycemic events were recorded (severe events were reported for the 6 months before baseline and any event for 4 weeks before baseline). Prospective events, both severe and any (4 weeks from baseline) were reported in SAQ2 and patient diaries. Differences in incidence of hypoglycemia reported were assessed using two-sided tests.

Results: Of the 7289 patients assessed in the IO HAT study, 2594 (T1D, n=154; T2D, n=2440) were from the four countries viz., Bangladesh, Indonesia, Philippines, Singapore, South Africa, Turkey and UAE. Any hypoglycemia rates, per patient-year (PPY), during retrospective and prospective period were 33.9 and 57.1 PPY in patients with T1D (RR 1.68, p<0.001). Any hypoglycemia rates, during retrospective and prospective period were 12.2 and 22.6 PPY in patients with T2D (RR 1.85, p<0.001). Rates of any and nocturnal hypoglycemia were lowest in patients with T2D on short-acting regimens during prospective period (Any, 19.4; Nocturnal, 1.4 PPY).

Conclusion: With use of the IO HAT tool and patient diaries in South East Asian cohort, a higher prospective incidence of any and severe hypoglycaemia was reported. These results indicate that hypoglycaemia may be retrospectively underestimated by patients.

P52
The Presence of Fatty Liver has a Differential Impact on the Development of Diabetes according to the Persistence of Fatty Liver

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Objective: The aim of our study was to evaluate whether variable fatty liver status over time influence the risk of type 2 diabetes differently.

Methodology: We analyzed the data from 7,849 subjects without type 2 diabetes who underwent comprehensive health check-ups annually for 5 years. All subjects had an abdominal ultrasonography annually. The risk of incident diabetes was assessed in individuals with sustained non-alcoholic fatty liver disease (NAFLD), individuals with changed fatty liver status (intermittent NAFLD group), and individuals who did not have NAFLD (never NAFLD group) during the study period. A subgroup analysis was done of subjects in the intermittent NAFLD group. Incident diabetes was compared according to the number of time diagnosed as NAFLD by annual ultrasonography.

Results: During the mean follow-up of 4 years, subjects in the sustained NAFLD group had a HR of 1.55 (95% CI 1.16– 2.01) for the development of diabetes compared with those in the never NAFLD group, whereas the risk was not higher in the intermittent NAFLD group (HR 0.98, 95% CI 0.74-1.29). When compared with the intermittent NAFLD group, multivariable adjusted HR for incident diabetes was 1.58 (95% CI 1.25-1.99) in the sustained NAFLD group. As the number of times diagnosed as NAFLD increased, the proportion of subjects who developed diabetes also increased (p=0.002).

Conclusions: The presence of fatty liver was differentially associated with incident diabetes based on its duration. The persistence of fatty liver status is an important factor for an independent association between NAFLD and incident diabetes.
**P53**

**Comparison of GLP-RAs on Glucose Excursion, Insulin and Glucagon Secretions and Gastric Emptying**

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**Objective:** Short- and long-acting glucagon-like peptide 1 receptor agonists (GLP-1RAs) have different actions on insulin and glucagon secretions and gastric emptying, which results in different outcomes of glycemic control. However, their contributions to glycaemia in response to short- and long-acting agents have not been fully evaluated in clinical setting.

**Methodology:** We performed meal tolerance test before and 12 weeks after initiation of the long-acting GLP-1RA liraglutide (Lira) or the short-acting GLP-1RA lixisenatide (Lixi) in Japanese patients with T2DM, prescribed less than or equal to one medication (Lira, n=6; age 49.0 ± 11.4; duration 8.2 ± 9.2 years; ΔGST 3.1±0.5 ng/ml/Lixi, n=7; age 48.0 ± 6.7; duration 5.6 ± 5.5 years; ΔGST 2.7 ± 1.1 ng/ml). Plasma glucose, insulin, and glucagon were measured and gastric emptying was measured using 13C breath test for 4 hours after solid test meal.

**Results:** After 12-week administration, HbA1c and bodyweight were significantly improved in both groups (HbA1c (%)): Lira, 9.0 ± 0.8 to 6.6 ± 1.1; Lixi, 7.7 ± 1.0 to 6.3± 0.4/BW (kg): Lira, 81.9 ± 12.1 to 75.9 ± 9.0; Lixi, 91.0 ± 26.4 to 89.3 ± 27.1. Gastric emptying was delayed in Lixi but not in Lira group [T1/2 (min)]; Lira, 35.6 ± 16.2 to 30.5 ± 9.6 min; Lixi, 24.1 ± 3.5 to 76.3 ± 35.0). Postprandial insulin secretion was significantly enhanced in Lira but not in Lixi group (IRI-AUC0-240(uIU/dl · min): Lira, 8391 ± 3400 to 9628 ± 3782; Lixi, 14113 ± 4326 to 6566 ± 3823).

**Conclusion:** These results partially support the notion that long-acting agents improve glycemic control through enhanced insulin secretion and that short-acting agents do so through delayed gastric emptying.

**P54**

**Association between Serum Uric Acid Level and Diabetic Peripheral Neuropathy in Patients with Type 2 Diabetes**

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**Objectives:** Two main objectives of the study were to detect the proportion of high serum uric acid level among diabetic patients and to find out the association between serum uric acid level and diabetic peripheral neuropathy (DPN).

**Methodology:** Sixty-one type 2 diabetic patients were enrolled from among patients with T2DM admitted at the medical wards. After excluding the patients who did not meet the criteria, the enrolled patients were divided into two groups: "with diabetic peripheral neuropathy"(40 patients) and "without diabetic peripheral neuropathy"(21 patients) according to NDS and NSS scores. Blood tests for serum uric acid level were sent for all enrolled patients and compared between two groups.

**Results:** The comparison of DPN according to age groups showed no significant association between age and DPN (p=0.399). Other variables like gender and duration of diabetes also showed no association (p=0.596 and p=0.318 respectively). But meaningful correlation of DPN with high BMI (p=0.04) and high serum uric acid level (p=0.003) were seen in this research.

**Conclusion:** According to this study, high serum uric acid level can be regarded as a predicting risk factor for DPN.

**Recommendation:** Further studies are therefore required to better assess the prevalence and the characteristics of high serum uric acid level among patients with DPN.
Evaluation on the Knowledge, Attitude and Practices of Elderly Patients with Diabetes on Diabetic Complications

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Objectives: To evaluate the knowledge, attitude and practices (KAP) of elderly diabetic patients on diabetic complications and identify some relating factors.

Methodology: A random sample of 176 diabetic patients was selected from the outpatient clinics at National Geriatric Hospital, Hà Nội, Vietnam from 7th August to 1st November 2015, and their knowledge, attitude and practices on diabetic complications were assessed using a questionnaire developed and validated by the investigators. Cognitive and physical disability were assessed by using clock drawing, 4m walking test and self-reported performance.

Results: Among 176 diabetic patients, 81 patients (64%) had good knowledge, 164 patients (93.2%) had a positive attitude about how to control diabetic complications and only 94 patients (53.4%) had good practice patterns. 85.8% of diabetic patients were aware of the diabetic complications to heart, eyes, kidneys and nerves. There was an adverse correlation between age (OR:-2.2, 95% CI:-4.4; -0.04, p<0.05) and physical activity (OR:-1.7, 95% CI:-2.9; -0.4, p<0.05) with patients’ knowledge; while educational attainment and duration of diabetes showed positive correlation (p<0.05). There was a negative correlation between attitude and patients’ age (OR:-2.1, 95% CI:-3.7; -0.5, p<0.05), but a positive correlation with educational level (p<0.05). However, those who live in rural areas or do not live with family were more likely to have low practices (p<0.05).

Conclusion: The study showed relatively good levels of KAP on diabetic complications. Age, educational level, physical activity, and duration of diabetes were significantly associated with the domains of KAP.

Activities of Daily Living and Related Factors in Elderly Patients with Type 2 Diabetes

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Objectives: The aim of the study was to evaluate activities of daily living and some related factors in elderly patients with T2DM at National Geriatric Hospital, Vietnam.

Methodology: A cross-sectional descriptive study included 412 patients diagnosed with type 2 diabetes according to WHO-2006. Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) were assessed in all participants. We used χ² statistics and logistic regression to assess the rate and factors associated with activities of daily living.

Results: The average age of subjects was 71.9 ± 7.6 years, the ratio of female/male was 1.3. The average duration of diabetes was 6.6 ± 3.5 years. The rate of ADL and IADL declined functions was 47.1% and 65%, respectively. There was a positive correlation between functional decline in daily activity and age, duration of type 2 diabetes, blood glucose level more than 7.2 mmol/l and HbA1C more than 7%. There was no correlation between limited function and gender.

Conclusions: Age, duration of type 2 diabetes, blood glucose and HbA1C levels were associated with the decline in activities of daily living (ADLs) and instrumental activities of daily living (IADLs). ADL and IADL assessment is simple and easy to perform and should be routinely conducted to detect early functional impairment in elderly patients with T2DM.
P57
Uric Acid and Regional Body Fat Distribution in Patients with Type 2 Diabetes Mellitus

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Background: The progressive increase in serum uric acid may be linked to the rising prevalence of overweight and obesity. The relationship between hyperuricemia and the regional distribution of body fat in patients with type 2 diabetes mellitus (DM) is not well established.

Objective: The aim of this study was to investigate the relationship between uric acid and abdominal fat distribution in patients with T2DM.

Methodology: A total of 323 subjects with type 2 DM were included in this study. All subjects were classified into quartile by uric acid. Clinical and anthropometric profile, such as body mass index (BMI), waist and hip circumferences, waist-to-hip ratio (WHR), skinfold thickness, and lipid profiles were measured. Abdominal fat amount was measured by single slice abdominal computed tomography scanning.

Results: Uric acid was positively correlated with BMI ($r=0.170$), waist circumference ($r=0.177$), visceral fat area ($r=0.156$), and subcutaneous fat area ($r=0.260$) in men. Patients within the highest quartile in men showed significantly higher visceral fat area, subcutaneous fat, BMI, WHR, and waist circumference. Patients within the highest quartile in women showed significantly higher visceral fat area. In multiple regression analysis, there was no significant association between the visceral fat area and the serum uric acid levels ($b$-coefficient = 0.120, $p=0.115$).

Conclusion: Our data shows that uric acid levels were correlated with visceral fat area in patients with T2DM, especially in men. We need to study the correlation between uric acid levels and central obesity in more patients.

P58
Efficacy and Safety of Ranolazine as an Oral Antidiabetic Agent in Patients with Type 2 Diabetes Mellitus: A Meta-Analysis

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Background: Ranolazine is an anti-anginal drug that mediates its effects by inhibition of cardiac late sodium current. Although not yet approved for treatment of type 2 diabetes mellitus (T2DM), several clinical trials have shown that ranolazine was associated with reduction in HbA1c.

Objective: To determine the efficacy and safety of ranolazine as an oral antidiabetic agent in patients with T2DM.

Methodology: A meta-analysis was conducted on clinical trials of ranolazine as oral anti-diabetic agent in patients with T2DM using RevMan 5.3 software. Of the fifty (50) articles identified, seven (7) articles met eligibility criteria. Six (6) randomized controlled trials involving 1,802 patients were included.

Results: Compared to placebo, ranolazine significantly reduced HbA1c by $0.36\% [-0.45, -0.28]$ ($p < 0.00001$) and fasting glucagon by $3.56 \text{ pg/mL} [-4.43, -2.69]$ ($p < 0.00001$). No significant change was noted in fasting plasma glucose [-60, 0.31] ($p=0.54$), fasting insulin [-1.63, 0.60] ($p=0.36$), and fasting C-peptide [-0.17, 0.09] ($p=0.57$). Furthermore, no significant difference was noted for hypoglycemic episodes with ranolazine versus placebo [0.87, 3.42] ($p=0.12$).

Conclusion: This meta-analysis demonstrates that ranolazine can modestly reduce HbA1c and fasting glucagon, without increasing hypoglycemic events among patients with T2DM. This may be particularly beneficial among patients with T2DM suffering from angina.
**P59**

**Glycemic Variability and In-Hospital Mortality among Elderly Patients in the ICU**

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**Objective:** Significant glucose variability affects the outcome of critically ill patients but has not been well studied in elderly patients in the intensive care unit (ICU). Our objective was to determine the effect of glycemic variability on the in-hospital mortality among critically ill elderly patients.

**Methodology:** We conducted a retrospective cohort study including elderly patients aged 65 years old and above who were admitted to the ICU. Measures of glycemic variability such as standard deviation (SD), coefficient of variation (CV), mean amplitude of glycemic excursion (MAGE), and glycemic lability index (GLI) were calculated. Multiple logistic regression analysis was used to determine the association of glycemic variability and in-hospital mortality.

**Results:** All glycemic indices were significantly higher among in-hospital deaths except GLI. SD was removed from the logistic model due to presence of collinearity. Multivariate logistic regression analysis showed that glycemic variability as measured by CV, MAGE, and GLI was not associated with in-hospital mortality. However, when mortality was plotted against CV quartiles when patients were sub-grouped according to the mean glucose level, there was a trend towards greater in-hospital mortality with increasing glycemic variability among patients with mean glucose level (MGL) greater than 180 mg/dL.

**Conclusion:** Glycemic variability is not independently associated with in-hospital mortality among critically ill elderly patients after adjusting for other factors. However, findings of higher mortality among elderly patients with increasing glycemic variability in patients with MGL more than 180 mg/dL warrants further investigation to determine if the association is present in this subgroup of patients.

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**P60**

**Analysis of Elevated Fasting Glucose Levels, Insulin Resistance and Cognitive Function in Elderly with Diabetes Mellitus**

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**Background:** The number of elderly globally is on the rise. This leads to an increase in degenerative diseases as well including diabetes mellitus. Previous research has supported the association of diabetes mellitus with cognitive function, although the mechanism is unclear.

**Objective:** To determine the relationship of elevated fasting glucose levels, insulin resistance and cognitive function in elderly patients with diabetes mellitus.

**Methodology:** This research used cross-sectional method. This study was conducted in the elderly population in Yogyakarta Indonesia. 120 elderly patients with Diabetes Mellitus who fulfilled the inclusion and exclusion criteria are tested for fasting blood glucose, insulin resistance calculated by HOMA–IR index and cognitive function examined with Mini Mental State Examination (MMSE). This study used statistical test with correlation analysis to determine the relationship of fasting glucose levels, insulin resistance is assessed based on HOMA-IR index with cognitive function of elderly patients with Diabetes Mellitus.

**Results and Conclusion:** There was a correlation between elevated fasting blood glucose levels with cognitive function ($p<0.05$) and there was a correlation between insulin resistance and cognitive impairment in elderly patients with diabetes mellitus ($p<0.05$).
P61
Relationship between Mean Platelet Volume and Type 2 Diabetic Patients with Macrovascular Complications

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Introduction: Antiplatelet therapy is usually considered as a cornerstone of diabetic macrovascular complications and is recommended by guidelines. Increased Mean Platelet Volume (MPV) as a marker of larger platelet size is found to be platelet hyperactivity and vascular endothelial abnormalities resulting in microvascular complications.

Objectives: To describe the relationship between mean platelet volume and type 2 diabetic patients with macrovascular complications.

Methodology: 50 cases of patients with T2DM with macrovascular complications were chosen. About 3 cc of venous blood was collected in EDTA tube and sent to do complete picture (Automatic Haematological Analyzer Sysmex XS-800i, 24 parameters).

Results: MPV was increased in 88% of patients with T2DM with macrovascular complications. 76.2 % of male (16 out of 21) and 96.6% of female (28 out of 29) had high MPV. There was no significant difference between MPV and age groups (p 0.694), MPV and sex group (p 0.059). Duration of diabetes also was not correlated with MPV. Mean MPV values among macrovascular complications are 10.8 ± 1.4 in patients with ischemic heart disease, 11.0 ± 1.3 in patients with cerebrovascular accident and 11.4 ± 1.2 in patients with peripheral arterial disease.

Conclusion: Increased MPV is strongly and independently associated with diabetic macrovascular complications. MPV measurement is simple and cost-effective and might be useful in patients with diabetes for primary prevention of cardiovascular disorders by monitoring MPV.

P62
Evaluation of Health-Related Quality of Life in Elderly Outpatients with Diabetes

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Objective: To assess the health-related quality of life (HRQoL) and identify associated factors in elderly outpatients with diabetes.

Methodology: A cross-sectional study was conducted at Outpatient Department of National Geriatric Hospital from July to November 2015. Information about socio-demographic, health status and quality of life (measured by EQ-5D-3L and EQ-VAS) was collected. A stepwise tobit regression was used to exploit associated factors with patients' quality of life.

Results: One hundred seventy-one patients with diabetes participated in this study with average age of 69.4 ± 6.8. 78 patients (49.1%) had duration of diabetes more than 10 years. The rate of co-morbidity was 93%. The mean score of the EQ-5D was 0.8 ± 0.2 (UK-TTO) and the average VAS-score was 57.5 ± 14.4. Proportion of patients with problems in the EuroQoL-5D dimensions: mobility (33.3%), anxiety/depression (24%), pain/discomfort (21%), usual activities (21.1%) and self-care (10.5%). After adjusting for age, gender, living place, cohabitation, affordability for diabetes treatment, diabetes duration, number of medications, blood pressure monitor, ability to do activities of daily living in past 2 weeks and feeling tired in the past week were the factors associated with EQ-5D index as well as EQ-VAS score (p<0.05).

Conclusion: This study showed the low quality of life among elderly outpatients with diabetes. The strongest determinants of reduced HRQoL in people with diabetes were comorbidities, polypharmacy, high HbA1C, low physical activity and poor endurance/exhaustion.
P63
Assessment of Fall Risks and Related Factors in Elderly Patients with Type 2 Diabetes Mellitus

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Objective: To assess risk of falls and related factors in elderly patients with type 2 diabetes.

Methodology: This is a descriptive cross-sectional study involving 412 patients with type 2 diabetes aged ≥60 years old, selected by convenience sampling at the Outpatient Department. The Hendrich II Fall Risk Model was used to assess risk of falls: subjects had high risk of falls if total points were 5 or more. Patients responded to a questionnaire about their health, depressive symptoms (using Geriatric Depression Scale), and cognitive impairment (using the Mini-Cog test).

Results: One hundred seven elderly patients with diabetes (26%) had high risk of falls. Females had higher fall risk (30.5%) than males (20.1%), p<0.05. There were positive correlations between risk of falls and advanced age (r=0.66, p<0.05) and duration of diabetes (r=0.57; p<0.05). The risk of falls was significantly higher in the depressive symptom group than those in the non-depressive symptom group (p<0.05). Cognitive impairment increased risk of falls (OR: 37.6, 95%CI: 20.5-69.0, p<0.01). Insulin use increased the risk of falls by more than two-fold compared with those receiving oral anti-diabetic agents (OR: 2.3, 95%CI: 1.4-3.7, p<0.01). There was no correlation between fasting blood glucose and HbA1c with risk of falls in elderly patients with T2DM (r<0.25; p>0.05).

Conclusion: Elderly patients with T2DM had high risk of falls, especially in those with advanced age, long duration of diabetes, cognitive impairment and depressive symptoms.

P64
Depressive Symptoms and Related Factors in Elderly Patients with Diabetes at a National Geriatric Hospital

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Objective: To identify the presence of depressive symptoms and the clinical variables associated with depressive symptoms in elderly patients with diabetes.

Methodology: A total of 412 patients with diabetes aged ≥60 years old admitted to a National Geriatric Hospital from October 2015 - October 2016 were evaluated. Depressive symptoms were assessed by using the Geriatric Depression Scale (GDS). Socio-demographic, medical history, glycaemic control, daily activities and fall risk factors were investigated. Chi-square (χ2) statistics and logistic regression were used to analyse the collected data.

Results: 327 (79.4%) patients were categorized according to presence of depressive symptoms. The proportion of participants with mild, moderate and severe depressive symptoms were 62.9%, 14.6% and 1.9%, respectively. Advanced age, low educational level, history of hypertension, decreased ADL, duration of diabetes ≥5 years and using insulin were higher in the depressive symptom group than those in the non-depressive symptom group (p<0.05). The level of HbA1c was significantly different between the depressive symptom group and the non-depressive symptom group (7.74 ± 1.57 % and 6.61 ± 1.21 %, p<0.05, respectively). Depressive symptoms increased risk of falls (OR: 2.93; 95% CI: 1.28-6.72, p=0.01), uncontrolled fasting blood glucose (OR: 4.09, 95% CI: 2.1-7.9, p<0.001) and impairment of IADL (OR: 7.12, 95% CI: 3.4-14.9, p<0.001).

Conclusion: The prevalence of depressive symptoms was high and the presence of depressive symptoms was associated with poor glycemic control, fall risk and impairments of ADL, IADL among elderly patients with diabetes.
P65
Rare Case of Metformin Associated Lactic Acidosis in a Patient with Renal Failure

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Objective: Metformin associated lactic acidosis (MALA) is an extremely rare condition (0.03 cases/1000 patient years) with a high mortality rate of 50%. We hereby describe a case outlining the diagnostic and management challenges.

Methodology: A 63-year-old Malay lady was admitted for progressive confusion and lethargy for two days. She had end stage renal failure on regular hemodialysis thrice weekly, ischemic heart disease, hypertension and type 2 diabetes mellitus on insulin mixtard (30/70) injections. Her last dialysis session was two days before admission. She was afebrile and hypertensive at 193/80 mmHg with normal pulse rate and oxygen saturation. Her capillary blood glucose was 2.2 mmol/L.

Although the initial investigations were consistent with renal failure, she had high anion gap metabolic acidosis (pH 7.22, bicarbonate 8 mmol/L) with high lactate levels at 16.2 mmol/L (>2.2). There was no attributable evidence of sepsis, cardiac or intracranial events. Hypoglycemia was corrected and urgent dialysis was initiated in view of the severe lactic acidosis and renal failure. Further history revealed that for the past few months, the patient was surreptitiously given metformin for convenience. The serum metformin level was found to be 7.0 μgram/ml and MALA was diagnosed.

Results: She was given supportive therapy and regular dialysis. The lactate level improved to 3.6 mmol/L on day four of admission and she was subsequently discharged.

Conclusion: Metformin should be avoided in renal failure due to risks of MALA. It is important to consider MALA in cases of unexplained lactic acidosis. Treatment is largely supportive.

P66
Concentrated Growth Factor for the Treatment of Intrabony Defects in Aggressive Periodontitis among Adolescents with Diabetes

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Background: Periodontitis is a disease which causes the breakdown of the peripheral tissues of the tooth. Regeneration of these tissues has become the most vital aim of periodontal surgery. For this situation, bone graft, synthetic materials and growth factors have been researched for years. Recently, there is a new material found called “Concentrated Growth Factor” (CGF).

Objective: The current study was designed to evaluate the efficacy of CGF, with open flap debridement (OFD), in treatment of intrabony defects in aggressive periodontitis among adolescents with diabetes.

Methodology: Twelve patients with single defects were categorized into two equal treatment groups: group I: OFD alone, group II: OFD with CGF. Clinical parameters like site Plaque Index (PI), Gingival Index (GI), Gingival Bleeding Index (GBI), Probing Pocket Depth (PPD), Relative Attachment Levels (RAL) were recorded at baseline, before surgery and 6 months post-operative. Percentage radiographic intra-bony defect depth reduction was evaluated using computer-aided software at baseline and 6th months.

Results: OFD with CGF group showed significant PD and RAL gain than OFD alone group. Group II sites showed a significantly greater percentage of radiographic defect depth reduction as compared to Group I at 6th month.

Discussion: OFD + CGF group showed greater improvement in clinical parameters with greater percentage of radiographic defect depth reduction as compared to OFD alone group in treatment of intrabony defect in aggressive periodontitis in adolescents with type 1 diabetes mellitus.
Persistent Hypoglycemia in a Patient with Giant Phyllodes Tumor Successfully Treated with Dexamethasone and Surgery

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A 34-year-old female with a 13-year history of enlarging right breast mass was admitted for elective surgery. Physical exam revealed a giant (33 x 26 x 16 cm), fungating, right breast mass. She developed symptomatic hypoglycemia at the ward and fulfilled Whipple’s triad. Hypoglycemia persisted despite glucose infusion and increased carbohydrate intake. Lab tests showed a low C-peptide and low normal insulin level. Further investigations excluded drugs, systemic illness, thyroid dysfunction, renal or hepatic failure as causes of hypoglycemia. The presence of a phyllodes tumor (PT) along with hypoglycemia prompted consideration of non-islet cell tumor hypoglycemia (NICTH). Hypoglycemia improved with dexamethasone 4mg IV every 8 hours prior to right total mastectomy. Histopathology confirmed a benign PT. There was no recurrence of hypoglycemia after tumor removal. This supports the diagnosis of PT-related hypoglycemia.

NICTH is a rare paraneoplastic process linked to excess secretion of altered forms of IGF-II. Treatment of NICTH is directed towards tumor removal. However, hypoglycemia must be controlled prior to definitive therapy. Diazoxide, growth hormone, octreotide and glucagon may be given to increase blood glucose but these drugs are not widely available. An alternative option is to utilize the hyperglycemic side-effect of glucocorticoids. Glucocorticoids induce hyperglycemia via its action on glycogen, protein and lipid metabolism. In addition, glucocorticoids suppress IGF-II. In our case, dexamethasone was successfully used to rapidly induce hyperglycemia as preparation for surgery.

Hence, NICTH should be considered in a patient presenting with a tumor and hypoglycemia. Dexamethasone may be used to rapidly increase serum blood glucose to allow institution of definitive therapy.

The Clinical Characteristics of Diabetic Ketoacidosis with Pancreatic Enzyme Elevations

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Objective: Hyperamylasemia or hyperlipasemia is not rare in patients with diabetic ketoacidosis (DKA). However, the significance and mechanism of these enzyme abnormalities in DKA are poorly understood. Therefore, we studied the significance of pancreatic enzyme elevations in patients with DKA.

Methodology: We retrospectively collected 68 patients with DKA who had pancreatic enzyme tests done at admission. We analyzed age, sex, pH, anion gap, serum HCO3-, time and amount of insulin to resolve DKA.

Results: Comparing DKA patients with normal pancreatic enzyme (n=52, 27 men, 49.46 ± 22.18 years) and DKA patients with hyperamylasemia or hyperlipasemia (n=16, 15 men, 58.92 ± 16.29), there were statistical differences in pH (7.24 ± 0.18 vs.7.12 ± 0.17, p=0.045), anion gap (30.97 ± 9.41 mEq/L vs. 38.45 ± 6.33 mEq/L, p=0.018) and, serum HCO3- (11.13 ± 6.77 mEq/L vs. 6.50 ± 4.33 mEq/L, p = 0.039). However, there were no statistical differences in time and amount of insulin to resolve DKA. DKA patients with threefold or greater elevation in serum amylase or lipase (n=6, 6 men, 53.00 ± 10.89 years), which is one of the criteria to diagnose acute pancreatitis, showed no statistical difference in pH, anion gap, serum HCO3-, time and amount of insulin to resolve DKA compared to DKA patients having mild elevations of pancreatic enzymes.

Conclusion: These results suggest that DKA patients with hyperamylasemia or hyperlipasemia would have higher likelihood of having more severe acidosis.
**P69**

**Bell's Palsy Complicated by Undiagnosed Ketosis-Prone Diabetes Mellitus—When the Unexpected Coincidence Goes South**

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**Background:** Bell’s palsy is caused by the inflammation and compression of the facial nerve secondary to the edema. Patients with diabetes are more prone to nerve degeneration that result in mononeuropathy. Herein, we report a case of ketosis-prone diabetes mellitus (KPDM) who presented with diabetic ketoacidosis as initial presentation after receiving a high-dose oral steroid treatment for Bell’s palsy.

**Case:** A 21-year-old Thai obese man had a history of polyuria and weight loss for 1 month. He also developed an acute right hemiplegia of the facial muscles and received 60 mg/day of oral prednisolone for 2 days. He presented with marked mucosal dehydration, though no tachypnea. The laboratory investigation revealed the following: plasma glucose 469 mg/dl, A1C 12.7%, bicarbonate 18 mEq/L, serum ketone 1.0 mmol/L. Diabetic ketoacidosis was diagnosed. Additionally, further history taking revealed a history of excessive intake of sugar-containing soft drinks (>2 liters/day) for several months. Assessment of the beta-cell response to a standardized mixed meal and pancreatic autoantibodies showed absence of autoantibodies, but preserved beta-cell function (subtype A-β+ of KPDM). In this case, insulin withdrawal may occur in the near future. Consequently, the patient recovered spontaneously from Bell’s palsy a few weeks later after resolution of DKA.

**Conclusion:** Bell’s palsy could present as a form of diabetic mononeuropathy that can develop in any type of diabetes including KPDM. A careful history taking in Bell’s palsy is important prior to starting steroid treatment as it may aggravate hyperglycemia in undiagnosed diabetes, or worse, ketoacidosis in this case.

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**P70**

**Clinical Characteristics and Outcomes of Care in Adult Patients with Diabetic Ketoacidosis - Don't Forget the K+ In DKA**

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**Introduction:** Diabetic ketoacidosis (DKA) is a metabolic catastrophe which could occur in any type of diabetes. Even fundamental key points of DKA treatment had been perceived, some differences exist about treatment protocols in each physician, highlighting the need to assess adherence to DKA guideline.

**Methodology:** A retrospective study of DKA episodes admitted over a 12-year period (2005-2017) was done in Theptarin Hospital, a multi-discipline based diabetes center in Bangkok.

**Results:** A total of 65 DKA episodes occurred in 52 patients with diabetes (females 61.5%, mean age 48.6 ± 20.6 years, T1DM 53.8%, T2DM 38.5 %, A-β+ Ketosis-prone diabetes 7.7%, baseline A1C 11.2 ± 3.0%) during study period. While infection was the common precipitating factor in T2DM, omission of insulin was the usual precipitating factor in T1DM. SGLT2i-induced DKA had been found in 2 cases (one case of euglycemic DKA in T1DM and one case of urosepsis/SGLT2i-induced DKA in T2DM patient). During ongoing management, 33% of patients developed hypokalemia and, of those, supplementation was not prescribed as per protocol in all patients. Almost 11% of patients experienced hypoglycemia in the first 24 hours. One patient expired from the precipitating cause of DKA.

**Conclusion:** Inadequate metabolic monitoring and iatrogenic hypoglycemia remain areas of concern of DKA management. Occurrence of hypokalemia was related to poor adherence to protocol guidance on potassium supplementation. A strengthened educational program for nursing and medical staff should be emphasized to focus on metabolic monitoring and improved patient contact after hospital discharge.
**P71**

**Inflammatory arthritis and Diabetes Mellitus: Managing both diseases**

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**Introduction:** Diabetes mellitus is a key predictor of mortality in patients with rheumatoid arthritis (RA). Both RA and diabetes increase the risk of cardiovascular disease (CVD).

Rheumatoid arthritis (RA) is an autoimmune disease. The classic sign of any autoimmune condition is inflammation. In diabetes, the immune system attacks the pancreas.

**Cases:** A 46-year-old female presented with rheumatoid arthritis and obesity (non-usual). Fasting and post prandial blood glucose levels are high. Hepatic and renal functions are within normal limits. Therapy for this patient was Methotrexate, Prednisone, Calcium and folic acid, and rapid acting insulin. On follow-up after immunosuppressant treatment, the blood glucose and A1C were controlled over time.

Another case, a 52-year-old female with overt rheumatoid arthritis and osteoporotic fracture has uncontrolled diabetes mellitus. Patient was treated intensively due to severe joint inflammation and pain, and severe high blood glucose. After management, the RA and diabetes mellitus were controlled respectively.

**Discussion:** The relative risk for diabetes was increased by approximately 50% in patients with RA or PsA compared to people who don’t have these diseases. Physical activity is essential. The benefits of exercise include improved physical function and mobility, reduced blood glucose levels, and weight control.

In the case of inflammatory arthritides, inhibiting proinflammatory cytokines and reducing joint damage are the primary goals of treatment. These same inflammatory biomarkers are also increased in people with diabetes.

**Conclusion:** Being in control of both arthritis and diabetes is possible through medical management, self-care and consistent physical activity.

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**P72**

**Additive Effect of Non-Alcoholic Fatty Liver Disease on the Development of Diabetes in Individuals with Metabolic Syndrome**

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**Introduction:** Non-alcoholic fatty liver disease (NAFLD) is considered as the hepatic manifestation of the metabolic syndrome (MetS), with insulin resistance as the common pathophysiology. In a current longitudinal cohort study, we evaluated the separate and combined effects of MetS and NAFLD on incident diabetes risk.

**Methodology:** Participants were categorized into four groups on the basis of the presence of NAFLD and MetS at baseline (i.e., with NAFLD, with MetS, with both, or without either). We compared the development of diabetes among these four groups.

**Results:** During the mean follow-up of 4 years, 435 of the 7849 participants (5.5%) developed diabetes. The age, sex, and smoking-adjusted risk of incident diabetes was higher in the NAFLD only group (HR 1.51, 95% CI 1.14–1.99), MetS only group (HR 2.82, 95% CI 2.01–3.95), and the group with both (HR 5.45, 95% CI 4.32–6.82) compared to the group with neither. When compared with the NAFLD only group, the adjusted HR for incident diabetes was 1.87 (95% CI 1.29–2.72) in the MetS only group and 3.62 (95% CI 2.74–4.77) the group with both. Among individuals with MetS, the presence of NAFLD showed a significant increase in risk of incident diabetes even after further adjustment for MetS components including fasting glucose, TG, BMI, systolic BP, and HDL-C (HR 1.53, 95% CI 1.09–2.16).

**Conclusion:** The presence of NAFLD further increased the risk of incident diabetes in individuals with metabolic syndrome. Our results suggest that coexistence of NAFLD has an additive effect on the development of diabetes in individuals with MetS.
P73
Retinopathy Grading and Glycemic Control of Patients with Diabetes in a Retinal Screening Clinic, Yangon General Hospital

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Introduction: The total number of patients with diabetes consulting at Yangon General Hospital out-patient diabetes clinic was 1160 in 2015. Estimated annual attendees are 1300 – 1500. From January 2017 to June 2017, 471 patients with diabetes were assessed in the retinal screening clinic of Diabetes and Endocrinology Department by using retinal camera donated by Brighter Future Foundation UK. Retinopathy grading was done by UK’s National Retinal Screening Committee guideline.

Objective: To review the correlation between retinopathy grading and glycemic control of patients with diabetes

Methodology: Hospital-based cross-sectional survey conducted on retinopathy record sheets of patients who were screened between January to June 2017

Results: A total of 471 patients with diabetes were screened from January to June 2017. Among them, 110 (23%) were males and 361 (77%) were females. 413 had type 2 diabetes, 24 had type 1 diabetes and 34 had gestational diabetes. According to the retinopathy screening guideline, no diabetic retinopathy (no DR) was found in 342 patients, non-proliferative diabetic retinopathy (NPDR) in 83 patients and proliferative diabetic retinopathy (PDR) in 46 patients. Mean HbA1c was 8.7% in no DR group, 9.33% in NPDR group and 10.27% in PDR group. Pearson correlation showed significant correlation (0.004) between value of HbA1c and retinopathy grading and also significant correlation (0.005) between value of HbA1c and maculopathy grading.

Conclusion: There is a significant correlation between retinopathy grading and glycemic control of patients with diabetes in this survey.

P74
U-shaped Relationship between Body Mass Index and the Incident Risk for Type 2 Diabetes Mellitus: The Korean Genome and Epidemiology Study (KoGES)

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Objectives: Body mass index (BMI) ≥25 is associated with increased risk for type 2 diabetes mellitus (T2DM) in Asians. However, it is still debatable if Asian-specific cut-offs of underweight (BMI<18.5) and overweight (BMI≥23) can predict T2DM. This study aimed to evaluate the incidental risk for T2DM according to BMI levels and assess the appropriateness of Asian-specific cut-off of BMI.

Methodology: A total of 7,660 Koreans without diabetes were classified into 5 groups by Asian-specific cut-off of BMI, and followed up for the development of T2DM. With a reference of normal BMI group, Cox proportional hazards model was used to calculate multivariate-adjusted hazard ratios (HR) and the 95% CI of incident T2DM in 5 groups. Subgroup analysis was conducted by gender and age of 60 or less.

Results: Adjusted HRs for T2DM significantly increased in underweight, obese and severely obese groups in all participants (adjusted HR; 1.85 [95% CI 1.25 – 2.73] in underweight, 1.14 [95% CI 0.97 – 1.33] in overweight, 1.31 [95% CI 1.13 - 1.51] in obese, 1.93 [95% CI 1.52 - 2.45] in severely obese). However, overweight group didn't show a statistically significant increase in adjusted HRs for T2DM. These findings indicate a U-Shaped relationship between incidental risk for T2DM and BMI, which was consistently observed in all age subgroups.

Conclusion: U-Shaped relationship was observed between incidental risk for T2DM and BMI. This finding suggests the necessity of further study and investigate the optimal cut-off of BMI in Asians.
**P75**  
*Patterns of Nerve Conduction Studies in Patients with Hyperesthesia and Diabetic Peripheral Neuropathy*

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**Objectives:** In the early stage of diabetic peripheral neuropathy (DPN), diagnosis is difficult as there are no symptoms and signs. However, hyperesthesia is known as an early manifestation of DPN. Although nerve conduction studies (NCS) have been suggested as surrogate markers and confirmitative methods for diagnosis of DPN, these are limited to the evaluation of early sensory change and small-fiber neuropathy. Measurement of current perception threshold (CPT) using Neurometer® at 2000, 250 and 5 Hz has been suggested as a comprehensive way of assessing patients’ symptoms of DPN. The aim of this study was to compare the parameters of NCS in patients with normal NCS but having hyperesthesia determined by Neurometer®.

**Methodology:** We retrospectively enrolled patients with T2DM who underwent both CPT test and NCS from January 2014 to December 2016. Results of Michigan Neuropathy Screening Instrument (MNSI) were collected to determine a subjective symptom score. CPT using the Neurometer® was applied at right index finger (C7 dermatome) and right great toe (L4/5 dermatome). If a study was not testable at the right side, left side was performed. Two hundred forty-two patients with T2DM were included in our final analysis. DPN was diagnosed by symptoms (MNSI score ≥3) and/or signs, and NCS.

**Results:** The grade score of CPT in lower extremities was significantly correlated with the diagnostic stage of DPN. The relationships between the CPT at 5 Hz, 250 Hz, and 2,000 Hz show significant inverse correlations in conduction velocities of tibial, peroneal, and sural nerve. Among 242 patients, fifty-three (21.9%; NCS normal and abnormal, 22 and 31, respectively) were found to have hyperesthesia based on grade scores of CPT. All measures of CPT at 5 Hz, 250 Hz, and 2,000 Hz showed significantly lower thresholds in hyperesthetic patients compared to asymptomatic patients. Parameters attributed to conduction velocities were not different between asymptomatic and hyperesthetic patients with normal NCS. However, ulnar sensory nerve action potential and sural nerve amplitude were significantly increased and decreased, respectively, in hyperesthetoric patients compared to asymptomatic patients.

**Conclusion:** The CPT is a useful instrument to detect hyperesthetic patients in the course of DPN. Sensory action potential or amplitude of extremities in NCS could be complementary to detect minimal changes in these patients even in normal NCS results. The results of the current study may prove useful in monitoring of patients in the course of DPN.

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**P77**  
*Leptin Responses to Meal in the Elderly Lean, Elderly Overweight and Elderly Diabetic Women with Intermittent Fasting*

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**Objective:** Evidence suggests that during feeding, leptin secretory pattern was linked to insulin-mediated glucose uptake in adipose tissue. The objective of the present study was to determine leptin responses to meal in elderly women with various metabolic states after ten-day intermittent fasting.

**Methodology:** It was a quasi-experimental study with repeated measures. Ten elderly lean women, eight elderly overweight women and nine elderly women with diabetes who observed Theravada Buddhism way of ten-day intermittent fasting at Pyae Sone Aye meditation center participated in the present study. Serum leptin level was determined at baseline, 1-hour postprandial, 2-hour postprandial, 4-hour postprandial and 6-hour postprandial after lunch on Day 2 and Day 10. Serum leptin concentration was analyzed by direct Sandwich ELISA method. SPSS (version 22) software was used to analyse the data.

**Results:** Serum leptin level significantly rose from 2-hour postprandial up until 6-hour postprandial (p<0.05) at Day 2 and Day 10 in elderly lean and overweight women. But in elderly women with diabetes, a significant rise in serum leptin level was found at 4-hour postprandial and 6-hour postprandial (p<0.05) at Day 2. Percent change in leptin response to meal at 2-hour postprandial was increased in elderly lean (2%), in elderly overweight (8%) and in elderly women with diabetes (7%) after intermittent fasting.

**Conclusion:** The present finding indicates that insulin-mediated leptin response is delayed in diabetes and intermittent fasting might improve this response.
Incretin Secretion and Glucagon Responses to Oral Glucose Tolerance Test in Newly Diagnosed Thai Patients with Type 2 Diabetes Mellitus

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Objective: This study aimed to examine the incretin secretion in newly diagnosed Thai T2DM compared with normal glucose tolerance (NGT) participants.

Methodology: A total of 16 Thai subjects with newly-diagnosed T2DM (onset of diabetes < 2 years) and healthy volunteers underwent 75 g OGTT and plasma glucose, insulin, C-peptide, glucagon, total GLP-1 and GIP level were determined.

Results: Thai subjects with newly-diagnosed T2DM (mean age 50.2 ± 8.9 yrs, mean duration 6.1 months, BMI 26.8 ± 3.5 kg/m²) displayed peak glucose at 60 mins compared with 30 mins in NGT group (mean age 42.1 ± 10.6 yrs, BMI 25.0 ± 3.4 kg/m²). Subjects with T2DM showed a rise in glucagon at 0-30 min. While median HOMA-IR was higher in subjects with T2DM (3.6 vs. 2.2, p=0.009), β-cell function assessed by 30 min insulinogenic index showed markedly lower in subjects with T2DM when compared with NGT group (0.4 vs. 1.1, p=0.001). Total GLP-1 levels were similar in both groups but GIP responses were significantly higher in subjects with diabetes especially at 30 mins following OGTT. Peak GLP-1 levels preceded the peak insulin response in both groups.

Conclusion: Although insulin resistance is the predominant path-physiological defects in Caucasians, impaired insulin secretion plays a major role in Thai patients with diabetes same as East Asian patients. There was no significant difference in GLP-1 levels between T2DM and healthy control which was consistent with other studies in Asian population. However, GIP responses were enhanced in Thai T2DM. Further studies are needed to compare different underlying mechanisms among Asian countries in order to develop pathophysiology-based treatment approaches in diabetes management.

Current Drug Treatment Landscape for Type 2 Diabetes –Results from Personalized A1C Audit Data

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Objective: It is important that a patient-centered approach be used to guide the choice of pharmacological agents. The aim of this study was to evaluate patterns of drug use among patients with diabetes in relationship to individualized A1C goal.

Methodology: This study used audited data in 2016 from a total of 400 randomly selected patients with T2DM at Theptarin hospital which is one of the most comprehensive diabetes centers in Bangkok. The relationship between medication use and documented personalized A1C were examined.

Results: The study included 400 patients (mean age 66.0 ± 12.5 yrs, DM duration 14.8 ± 9.7 yrs, BMI 26.5 ± 4.6 kg/m², A1C 7.1 ± 1.2%). Oral anti-diabetic drugs (OAD) were the most frequently used (74.0%) and the rate of insulin usage was 23%. Metformin was the most commonly prescribed (73.5%) followed by DPP4 inhibitor (48.3%) and sulfonylurea (34.0%). TZD was still frequently used (29.0%) especially in non-achieved A1C target. Among patients using insulin-based therapy, only 27.2% achieved individualized A1C target regardless of concomitant OAD or GLP1 receptor agonist use. Alpha-glucosidase inhibitor was only used in 2.3% while SGLT2i was used in 8.0% of patients.

Conclusion: This study gives a picture of the pattern of drug use among patients with diabetes in a private setting in Bangkok. DPP4 inhibitor was more preferred over sulfonylurea as an add-on treatment to metformin. TZD prescriptions did not decline radically after the publication of safety warnings as in other countries. Insulin user groups had the highest proportions of patients with poor A1C control compared with other medication class users.
**P80**

**Efficacy of Ranolazine in Lowering HbA1c in Patients with Type 2 Diabetes Mellitus**

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**Objective:** Cardiovascular diseases and diabetes mellitus are two disease entities that commonly coexist in a single patient. Ranolazine is an anti-anginal medication that has been shown to have HbA1c lowering effects in patients with diabetes in angina trials. The objective of this study is to determine efficacy and safety of Ranolazine in HbA1c lowering as an add-on therapy to existing anti-diabetic regimen. To date, there is no published systematic review and meta-analysis on this.

**Methodology:** A comprehensive literature search was done. The authors extracted data for characteristics, quality assessment and mean change in HbA1c after at least eight weeks of treatment with Ranolazine. RevMan 5.3 was used to analyze the data.

**Results:** Six RCTs were included to make up for a total of 1,650 patients with diabetes. Most of the studies had moderate risk of bias. The overall analysis showed an HbA1c reduction of 0.35% (-0.68 to -0.03, *p* = 0.03) however, the population was heterogenous (I²=100%).

The results showed a statistically significant lowering of HbA1c with Ranolazine. The heterogeneity was not eliminated by doing sensitivity analyses. The sources of heterogeneity identified were differences in the baseline HbA1c levels, the number of anti-diabetic agents used, duration and dose of Ranolazine therapy, and the presence of comorbidities.

**Conclusion:** Ranolazine as anti-diabetic therapy shows statistically significant HbA1c lowering effect. It can be a potential treatment option for patients with both diabetes mellitus and angina pectoris. Well-designed, prospective trials are recommended to determine the effect and safety on a less heterogenous population.

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**P81**

**Correlation between Circulating Betatrophin Level and Insulin Sensitivity in Centrally-Obese Male Subjects**

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**Objective:** To investigate relationship between serum betatrophin level and insulin sensitivity in centrally-obese male subjects compared to age-matched non-obese subjects.

**Methodology:** This cross-sectional comparative study was undertaken in 34 centrally-obese [Age: 48.9 ± 6.2 yrs, Body Mass Index (BMI): 26.8 ± 2.4 kg/m², waist circumference (WC): 98.2±6.3 cm] and 34 non-obese subjects [Age: 49.3 ± 3.3 yrs, BMI: 19.7 ± 2.8 kg/m², WC: 76.0±7.8 cm]. Insulin sensitivity and β-cell functions were assessed by homeostasis model assessment method (HOMA). Fasting plasma glucose was measured by glucose oxidase method. Serum insulin and betatrophin levels were determined by ELISA method.

**Results:** Significant increase of HOMA-IR in centrally-obese subjects compared with non-obese subjects [median and interquartile range; median (IQR): 4.5 (3.4-6.7) vs. 1.94 (1.3-3.2) *p*<0.001] indicated that insulin sensitivity was decreased in centrally-obese subjects. Median (IQR) of fasting serum insulin level [19.3 (15.3-28.5) vs. 9.8 (6.5-13.5) μIU/ml, *p*<0.001] and HOMA β-cell function [274.5 (192.9-467.0) vs. 167.6 (92.7-239.8), *p*<0.001] were significantly higher in centrally-obese subjects than that of non-obese subjects, indicating compensatory increased β-cell functions in centrally-obese subjects. Serum betatrophin level in centrally-obese group was significantly lower than that of non-obese group [2.4 (0.8-4.2) vs. 0.8 (0.4-2.4) ng/ml, *p*<0.05]. There was no significant correlation between serum betatrophin level and HOMA-IR (Spearman’s rho=0.136, *p* = 0.269) as well as HOMA β-cell function (Spearman’s rho=0.036, *p* = 0.771) in both groups.

**Conclusion:** Betatrophin could not improve beta-cell function and might not be involved in the compensatory mechanism of insulin resistance in central obesity.
P83

Life-Threatening Hypokalemic Paralysis in a Young Bodybuilder

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We report a case of life-threatening hypokalemia in a 28-year-old bodybuilder who presented with sudden onset bilateral lower limb paralysis a few days after his bodybuilding competition. His electrocardiogram (ECG) showed typical u-waves due to severe hypokalemia (serum potassium 1.6 mmol/L, reference range (RR) 3.5-5.0 mmol/L). He was admitted to the intensive care unit (ICU) and was treated with potassium replacement. The patient later admitted that he had exposed himself to weight loss agents of unknown nature, purchased online, and large carbohydrate loads in preparation for the competition. He made a full recovery after a few days and discharged himself from the hospital against medical advice. The severe hypokalemia was thought to be caused by several mechanisms to be discussed in this report. With the rising number of new fitness centers recently, the ease of online purchasing of almost any drug, and the increasing number of youngsters getting into the bodybuilding arena, clinicians should be able to recognize the possible causes of sudden severe hypokalemia in these patients in order to revert the pathophysiology.

P84

Idiopathic Hypogonadotrophic Hypogonadism after Testosterone Treatment

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Case: A 38-year-old previously well male with normal pubertal development presented with 3 month history of erectile dysfunction. Patient was initially noted to have difficulty in sustaining erection that progressed to complete loss of libido and erectile dysfunction. There was no history of head trauma, cranial surgeries, previous infection, strenuous exercise, steroid intake or history of illicit drug use. Physical examination showed absent eunuchoid facies. He had Tanner V axillary and pubic hair distribution with a penile size of 4.5 cm and testicular volume of 15ml on the left and 12 ml on the right. Hormone workup showed low testosterone at 109.4 ng/dl (NV 249-836ng/dl) with a low FSH and LH. Routine blood tests found his complete blood count, electrolytes and creatinine to be within normal range. Bone densitometry findings showed osteoporosis with a bone density T score of -3.5 at the lumbar area. Magnetic resonance imaging of the sella showed a tiny faint focus of hypointensity apparent in the early post contrast images but is not clearly delineated in the subsequent dynamic runs. Patient was given testosterone replacement therapy and PDE5 inhibitor which improved symptoms.

Conclusion: The underlying mechanism of hypogonadotrophic hypogonadism remains to be a puzzle due to the rarity of the disease. Since this disease involves only the gonadotropins, speculation in previous studies propose that it is an autoimmune disease. Treatment of patients with this disease should aim to address fertility goals of patients.
P85

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Pancreatic Neuroendocrine Tumor Secreting Vasoactive Intestinal Peptide: A Case Report

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Objective: Neuroendocrine tumor secreting vasoactive intestinal polypeptide (VIPoma) is a rare endocrine tumor.

Case: We report a case of neuroendocrine tumor secreting vasoactive intestinal polypeptide (VIP) in a 42-year-old Thai female who presented with chronic watery diarrhea and hypokalemic metabolic acidosis for 1 year. The stool was watery, yellow color, non-bloody with volume of about 300 ml each time. Blood for vasoactive intestinal polypeptide level was 360 pg/mL (normal < 75). The computed tomography revealed a mass at the uncinate process of the pancreatic head in parallel with increased tracer uptake at same area by octreotide scan. The patient had undergone partial pancreatectomy with complete resection of tumor. The pathology revealed 3 cm of pancreatic neuroendocrine tumor producing vasoactive intestinal peptide (VIPoma) without lymphovascular invasion. After tumor resection, clinical symptoms of watery diarrhea and electrolyte abnormality improved.

Conclusion: VIPoma is a neuroendocrine tumor presenting with chronic watery diarrhea and hypokalemic metabolic acidosis. Surgical resection is the gold standard of treatment.

P86

An Unusual Presentation of Wermer’s Syndrome: A Case Report

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Wermer’s syndrome (WS) or Multiple endocrine neoplasia type 1 (MEN-1) is a rare condition with an incidence of 1 in 30,000. It is commonly familial but sporadic forms may occur rarely. The syndrome is diagnosed by the presence of overproduction of hormones that involve either the parathyroid, pituitary and gastroenteropancreatic (GEP) tract. The parathyroid gland is the main endocrine organ that is involved in approximately 90% of patients with insulinoma accounting for only 10%. We report a case of a 59-year-old male who presented with a five month history of recurrent hypoglycemia and weight gain. The patient presented with Whipple’s triad and underwent a 72-hour fasting protocol which revealed high insulin and C-peptide levels. Computed tomography (CT) scan of the abdomen revealed a mass in the tail of the pancreas. Patient underwent distal pancreatectomy and histopathology confirmed insulinoma. Postoperatively, there was resolution of hypoglycaemia. Insulinoma can occur sporadically or as a part of MEN-1 in 6 to 8%. Work up for MEN-1 revealed asymptomatic hyperparathyroidism and the patient will undergo yearly screening for signs of hypercalcemia. Screening for WS among the patient’s first degree relatives, to rule out a familial type of this disease, was unremarkable. Hence, this is a sporadic form of WS. The patient upon follow-up had no more recurrence of hypoglycemia and had significant weight loss. It is important that when we are presented with a single endocrine problem, we should work up for a larger entity as missed diagnosis can have serious clinical implications.
**P87**  
Caught in between  
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**Introduction:** Partial androgen insensitivity syndrome is a rare syndrome that presents with a spectrum of defects in virilization and vary from women with mild degrees of virilization to sometimes fertile but undervirilized men.

**Case:** A 20-year-old male presented with gynecomastia. He noted beginning enlargement of the breasts, no discharges but with tenderness, starting around 11 years old. During puberty, he had minimal hair growth on the face, axilla, pubic area and legs, minimal deepening of voice, minimal scrotal enlargement. He identifies himself with the male gender and plays basketball and street games. He also had numerous opposite sex relationships in high school but denies sexual contact. He claims he masturbates since 13 years old. On physical examination, he had minimal facial, axillary and leg hair. He has tanner stage 5 mature breasts, pubic hair distribution of a female, covering smaller area than adult. Penis was 2cm in length with presence of prepuce and glans with hypospadias. Scrotum examination revealed less than 2 cm nontender symmetrical testicles. Laboratory workup revealed Karyotype 46 XY male. FSH (2.938 IU/L), LH (5.455 IU/L), DHEAS (3.12 umol/L), B-HCG (<0.1 mIU/mL), Prolactin (7.834 ng/mL), TSH (2.042 uIU/mL), FT4 (16.58 pmol/L), and cortisol (18.7 ug/dL) were all normal. While 17-hydroxprogesterone (3.007 ng/mL), Estradiol (88.490 pmol/L), Testosterone (51.958 nmol/L) were elevated.

**Conclusion:** The patient underwent intensive psychologic support. Eventually, he underwent corrective surgery with mastectomy and hypospadias repair. He was also advised to have high dose androgen therapy.

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**P88**  
Multiple Endocrine Neoplasia Type 1 Presenting as Insulinoma, Parathyroid Adenoma and Multiple Collagenomas  
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**Background:** Multiple Endocrine Neoplasia Type 1 (MEN1), a rare autosomal dominant disorder, can be diagnosed clinically by the presence of at least two primary MEN1-associated tumors that include parathyroid adenoma, enteropancreatic tumor, and pituitary adenoma. Cutaneous tumors are also common in this syndrome. We report a case of MEN1 presenting with insulinoma, parathyroid adenoma, and multiple collagenomas.

**Case:** A 43-year-old male had history of recurrent episodes of generalized body weakness associated with dizziness, diaphoresis, and tremors for six years, relieved with food intake. He had no family history of MEN1. He was obese with notable multiple skin-colored papulonodular skin lesions on the abdomen, back and extremities. He had a low fasting serum glucose of 41.72 mg/dl with unsuppressed serum insulin and C-peptide consistent with endogenous hyperinsulinemia. Contrast MRI of the abdomen revealed a 2 x 1.8 cm nodule within the pancreatic tail. Biopsy of the skin lesion was consistent with collagenoma. The occurrence of both insulinoma and collagenoma in this case prompted work-up for MEN1 which also revealed primary hyperparathyroidism. This was confirmed by a Sestamibi scan consistent with parathyroid adenoma. Screening for pituitary involvement was negative. Patient subsequently underwent staged distal pancreatectomy with splenectomy and subtotal parathyroidectomy. There was resolution of hyperinsulinemia and hyperparathyroidism postoperatively. Histopathology report was neuroendocrine tumor of the pancreas and parathyroid hyperplasia.

**Conclusion:** In the absence of a family history and genetic testing, screening with biochemical parameters and imaging is valuable in the diagnosis of MEN1 in case of a high index of suspicion.
Insulinoma Presenting as Agitation and Unusual Aggressive Behavior: A Case Report

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Objectives: To present a case of insulinoma initially presenting as agitation and unusual aggressive behavior with episodes of loss of consciousness and associated hypoglycemia.

Case: We describe the clinical presentation and course, laboratory and diagnostic findings, and management of a patient with insulinoma presenting as agitation and unusual aggressive behavior with episodes of loss of consciousness and associated hypoglycemia.

This is a case report of a 52-year-old male, hypertensive, without diabetes, who initially presented with agitation and unusual aggressive behavior with episodes of loss of consciousness and associated hypoglycemia. Upper gastrointestinal endoscopic ultrasound revealed unremarkable endosonography of the pancreas while octreotide scintigraphy showed octreotide-avid lesion in the area of the tail of the pancreas suspicious for a neuroendocrine tumor. Selective arterial calcium gluconate stimulation test and hepatic venous sampling was done with note of 2-fold and 4-fold elevation of hepatic vein insulin levels in the 30 second and 60 second samples respectively following calcium injection in the splenic artery supporting that possible localization of insulinoma in the pancreatic body and tail. The patient underwent distal pancreatectomy which significantly improved insulin levels post-operatively with resolution of hypoglycemia and no recurrence of agitation, aggressive behavior, and loss of consciousness.

Conclusion: An insulinoma is a rare neuroendocrine tumor, which may have delayed diagnosis due to varied symptomatology. Apart from hyperinsulinemic hypoglycemia, this condition may also present with neurological symptoms as well as behavioral changes as seen in this particular case, which can be corrected with proper diagnosis and management.
Central Obesity in Relation with Blood-Free Fatty Acid and Malondialdehyde Levels in Myanmar People

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Objectives: Obesity is a complex, multi-factorial, chronic disease involving genetic, metabolic and psychological components. Many researchers explored the linkage among obesity, free fatty acid and oxidative stress. Nowadays, central obesity becomes more important than general obesity in consideration of health issues. The study aimed to find out whether central obesity is associated with free fatty acid level and oxidative stress.

Methodology: This was a cross-sectional comparative study of subjects age between 35 to 45 years (n=80), involving both sexes. They were categorized into two groups; 40 centrally obese and control group according to Asian cut-off point of waist-hip ratio. The serum FFA and plasma MDA levels were determined by colorimetry methods.

Results: The mean serum FFA level of centrally obese adults was 16.07 ± 2.33 mg/dl which was significantly higher than those of the control group of 11.12 ± 1.47 mg/dl (p<0.001). The mean plasma MDA level of centrally obese adults was 1.80±0.19 μmol/L which was significantly higher than those of control of 1.24 ± 0.18μmol/L (p<0.001). There was positive correlation between serum FFA and plasma MDA in centrally obese group (r=0.716) (p<0.001) as well as control group (r=0.435) (p<0.05). But, there was a stronger positive correlation in centrally obese adults.

Conclusion: It can be concluded that adipose tissue lipolysis and plasma lipid peroxidation was more evident and also related to the levels of central adiposity.

Body Mass Index in Association with Frailty in Community-Dwelling Elderly

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Background: Frailty is a geriatric syndrome with increasing incidence and high influence on elderly population. Weight loss is a key component of frailty. However, obesity is associated with disability linked with frailty.

Objective: The study was intended to evaluate the correlation between body mass index (BMI) and frailty in community-dwelling elderly.

Methodology: Data was derived from a random sample of community-dwelling elderly individuals in Malang. The cross-sectional study included sixty-five community-dwelling people aged 65 and older. Frailty was defined as having three or more components, including slowness, weakness, exhaustion, low activity and decrease in body weight. Robust are healthy elderly. BMI is the weight in kilograms divided by the square of height in meters. Pearson correlation is used to associate frailty with BMI.

Results: Subjects of this study consist of 32 robust (49.2%) and 33 frail (50.8%) elderly. With 55 female (84.6%) and 10 male (15.4%), mean age 73.9 ± 7.7 years. The association between BMI and frailty showed a U-shaped curve. Frailty was associated in those with BMI <18.5 kg/m² and ≥25 kg/m². The correlation between frailty and body mass index were r 0.384 and p 0.002.

Conclusion: The increased levels of frailty shows in those with low and very high BMI. Obesity associated with slowness, decrease activity levels, weakness, exhaustion, and increased proinflammatory markers. Among underweight older people, high waist circumference was possibly responsible for increased proinflammatory markers. Diet and exercise should be the target of intervention in elderly people.
P93
Eating Habits and Social Support of Older Adults (Lima-Peru)

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Objective: Determine the correlation between the eating habits and the social support networks (SSN) in older adults of the ‘Centro Integral de atención al adulto mayor’ (Lima-Perú).

Methodology: Descriptive correlational cross-sectional study were two surveys (The Questionnaire of Eating Habits of the Elderly and The Lubben Social Network Scale) were applied to 91 seniors who attend care centers for older adults. Spearman’s correlation coefficient was used for correlation analysis using SPSS program 21.

Results: 49.5 %, 51.7 %, 64.8%, 71.4 % had inadequate dietary habits in daily consumption of food source of protein, carbohydrates, vitamins and minerals, salt, sugar and ultra high processed food dimension respectively. 37% were overweight and obese. 74% were at risk of desolation and desolate, likewise, The LSNS, presents a statistically significant correlation (Spearman’s C of 0.431) at a moderate level, with the total score of the questionnaire of food habits.

Conclusion: There is significant correlation between dietary habits and kin and nonkin SSN of older adults in the study. There is significant correlation between kin SSN and regular consumption of vitamins and mineral source of food and regular consumption of salt, sugar and ultra high processed snacks dimension. There is significant correlation between non-kin SSN and regular consumption of food source of protein and regular consumption of food source of vitamins and minerals. There is significant correlation between total SSN and total dietary habits of older adults in the study.

P94
Neck Circumference as a Measure of Central Obesity in Patients with Metabolic Syndrome

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Objective: To study the neck circumference as a measure of central obesity in patients with metabolic syndrome at the medical wards of Military Hospital, Yangon.

Methodology: Hospital based cross-sectional descriptive study. Time frame was between October 2013 and September 2015. A total of fifty-nine patients were included in this study. International Diabetes Federation (2005) criteria for metabolic syndrome was used to detect the patients with metabolic syndrome. Then, measurement of neck circumference was done in these patients.

Results: Among 59 patients with metabolic syndrome, most of the patients had ages between 30-39 years and 45.8% were male and 54.2% were female. Those with ages between 50-60 (55.9%) had increased neck circumference and it was found to be statistically significant (p=0.009). The gender difference was not statistically significant. Mean neck circumference in male was 35.96 ± 3.52 and in female was 36.03 ± 2.3. Regarding association of neck circumference and separate components of metabolic syndrome, fasting triglycerides in male patients and fasting blood sugar in both sexes were significantly associated with increased neck circumference (p=0.038, p=0.003, p=0.012). On the other hand, fasting triglycerides in female and high-density lipoprotein (HDL), high blood pressure in both sexes were not statistically significant.

Conclusion: Increased fasting blood sugar level was found among the patients with the metabolic syndrome who also had increased neck circumference and it was significant in both sexes while statistically significant association between the neck circumference and triglycerides was found only in male.
P95
Relationship between Respiratory Function and Serum IL-6 Level in Non-obese and Obese Male Adult Subjects

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Objective: The present study aimed to investigate the relationship between respiratory function and serum interleukin-6 level in non-obese and obese adult male subjects.

Methodology: A community-based cross-sectional comparative study was carried out in 30 non-obese and 71 obese male adult subjects of age 18–45 years who lived in Magway Township. Respiratory function was measured with Spirobank II spirometer and serum IL-6 level was determined by enzyme-linked immunosorbent assay. Comparisons were done by Mann-Whitney U test and Spearman’s rank correlation was used for correlation analysis by using SPSS.

Results: The percentage of predicted value of all respiratory function parameters of obese group was significantly lower than that of non-obese group (p<0.05). There was a significant difference of serum IL-6 level between non-obese group and obese group [median and interquartile range: 10 (10-11) pg/mL vs 38 (20-54) pg/mL, p<0.05]. There was a significant positive correlation between serum IL-6 level and anthropometric measurements such as BMI (r=0.519, n=101, p<0.001) as well as WC (r=0.547, n=101, p<0.001). All respiratory function parameters were significantly and negatively correlated with anthropometric measurements (BMI and WC) as well as serum IL-6 level. Anthropometric parameters are more significantly and strongly correlated with respiratory function parameters than proinflammatory cytokine, serum IL-6.

Conclusion: It can be concluded that mechanical effect of obesity is the principal determinant of respiratory function impairment and inflammatory effect of obesity partly contributed to respiratory function impairment associated with obesity.

P96
Isochromosome Xq in Mosaic Turner Syndrome: A Case Report

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Isochromosome Mosaic Turner Syndrome (IMTS) is a variant of Turner Syndrome (TS) characterized by cytogenetic profile of 1 or more additional cell lineages aside from 45X, and the presence of a structurally abnormal X chromosome consisting of either two short or two long arms. IMTS is rare, with only 8-9% prevalence among women with TS based on international studies, and 15% of all TS in the Philippines.

A 20-year-old female came in due to amenorrhea and alopecia. Physical examination revealed short stature, cubitus valgus and Tanner Stage 1 pubic hair and breast development.

Transrectal ultrasound revealed absent ovaries and infantile uterus. Hormonal evaluation revealed hypergonadotropic hypogonadism. Bone aging was that of a 13-year-old for females with non-fusion of epiphyseal plates. Cytogenetic study revealed 45,X [37]/46, X, i (X) (q10) [13]. This is consistent with a variant Isochromosome Mosaic Turner Syndrome.

She was screened for medical complications. Audiogram and two-dimensional echocardiography were unremarkable. She has dyslipidemia and was given statins. She has subclinical hypothyroidism with positive test for anti-thyroglobulin antibody. Her intelligence quotient (IQ) was below average. She received conjugated estrogen and progesterone that patterned the hormonal changes in normal menstrual cycle. On the third week of hormonal therapy, she developed breast mound and on the fourth week, she had her first menstrual period. Her alopecia resolved spontaneously.

The above case is a rare variant of Turner Syndrome requiring supportive, medical and psychological care.
**P97**

**Maternal Child Abuse as an Unusual Cause of Exogenous Obesity**

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**Introduction:** Obesity is a medical condition in which excess body fat has accumulated. Exogenous obesity is thought to be due to a combination of excessive food energy intake and a lack of physical activity.

**Case:** Here, a 3-year-old boy with exogenous obesity was presented. He has been admitted to our clinic for vomiting. Obesity was observed in his physical examination. Detailed history showed maternal child abuse. His vomiting was related to overfeeding and his mother was giving antiemetic drug before feeding. After his mother was treated, health of our patient improved.

**Conclusion:** I recommend that detailed history is an important part of evaluation of exogenous obesity.

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**P98**

**Hormonal Parameters in Pubertal Gynecomastia**

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**Introduction:** Gynecomastia is a benign proliferation of the mammary gland in males which might be unilateral or bilateral. It has been thought that the development of gynecomastia is due to the imbalance between estrogens and androgens. The aim of this study was to define the auxologic features of children with pubertal gynecomastia and to investigate possible hormonal factors that may lead to development of gynecomastia.

**Methodology:** This study is performed on 45 boys with gynecomastia and 45 control boys who are between 9-17 years old.

**Results:** Low or undetectable level of AMH was found in 43/45 (95.6%) women, only 2 (both without Busulphan or TBI) maintained normal AMH concentration and had normal ovarian function. 5/19 patients (transplanted in prepubertal age) had low but detectable AMH, normal FSH level and regular menstrual cycle without HRT. In those subjects residual ovarian activity is anticipated. 21/24 patients (transplanted later) had undetectable AMH and high FSH levels and received hormone replacement therapy.

**Conclusion:** Severe ovarian damage with low or undetectable levels of AMH was found in the majority of females who underwent HSCT after use of high-dose Busulphan or TBI. Fertility preservation through cryopreservation of ovarian tissue or oocytes should be offered prior to HSCT. Chance for successful cryopreservation of ovarian tissue or oocytes after HSCT in cases with residual ovarian activity (normal FSH, regular menstrual cycle but low AMH level) must be assessed at the centre for reproductive medicine.

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**P99**

**Ovarian Reserve after Stem Cell Transplantation in Childhood and a Chance for Fertility Preservation**

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**Objective:** Anti-Müllerian hormone (AMH) is a relatively novel tool in the assessment of ovarian reserve. It enables screening for early ovarian failure after cancer treatment.

**Methodology:** 45 young females underwent a haematopoietic stem cell transplantation (HSCT) at median age 13.4 years (range 4.2-18.1), 40 received Busulphan (16mg/kg) or total body irradiation (TBI) (≥12Gy) as a part of conditioning regimen. Ovarian function and serum AMH level were evaluated at median age 18.3 years (range 12.2-36.5). AMH was measured using enzymatic immunoassay (EIA) Immunotech (normal range 14.28-48.55 pmol/l).

**Results:** Low or undetectable level of AMH was found in 43/45 (95.6%) women, only 2 (both without Busulphan or TBI) maintained normal AMH concentration and had normal ovarian function. 5/19 patients (transplanted in prepubertal age) had low but detectable AMH, normal FSH level and regular menstrual cycle without HRT. In those subjects residual ovarian activity is anticipated. 21/24 patients (transplanted later) had undetectable AMH and high FSH levels and received hormone replacement therapy.

**Conclusion:** Severe ovarian damage with low or undetectable levels of AMH was found in the majority of females who underwent HSCT after use of high-dose Busulphan or TBI. Fertility preservation through cryopreservation of ovarian tissue or oocytes should be offered prior to HSCT. Chance for successful cryopreservation of ovarian tissue or oocytes after HSCT in cases with residual ovarian activity (normal FSH, regular menstrual cycle but low AMH level) must be assessed at the centre for reproductive medicine.
**P100**

**Pituitary Metastasis from Breast Cancer Presenting as Left Visual Defect: A Case Report**

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Tumors metastasizing to the pituitary gland are uncommon. Majority of patients developing pituitary metastasis were clinically asymptomatic. It is challenging to diagnose pituitary metastasis due to the lack of symptom and radiologic specificity from primary tumors. Breast and lung cancer are the most common primary s metastasizing to the pituitary.

**Objective:** To discuss the signs and symptoms of pituitary metastasis as well as its diagnosis, treatment and disease course

**Methodology:** We report a case of a 56-year-old female, diagnosed with left breast cancer stage III, estrogen receptor positive who underwent modified radical mastectomy of the left breast. She completed chemotherapy, radiation and herceptin therapy. Two years later, patient noted blurring of vision on the left eye.

**Results:** Ophthalmology consult was initially sought revealing unremarkable findings. Neurology requested for cranial MRI revealing an enhancing sellar/suprasellar mass, which may represent a pituitary macroadenoma. She then underwent pterional craniotomy, excision biopsy of tumor with frozen section. Histopathology report revealed metastatic carcinoma, breast primary. After the surgery, there was improvement of vision.

**Conclusion:** Although pituitary metastasis is a rare event in cancer progression, it should be one of the differential diagnoses in patients with malignancy especially in women with breast cancer presenting with ophthalmologic symptoms.

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**P102**

**Spontaneously Vanishing Sellar-Suprasellar Mass, Panhypopituitarism and Rashes in an Adult with Multisystem Langerhans Cell Histiocytosis: A Case Report**

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Introduction: Langerhans Cell Histiocytosis (LCH) is a rare disorder mainly affecting children. It has varied manifestations and prognosis. Diabetes Insipidus is the most common endocrinologic abnormality in LCH while panhypopituitarism is rare. Spontaneously vanishing sellar/suprasellar masses associated with LCH has not been reported in literature both locally and internationally. Skin involvement is common in LCH but manifests differently between children and adults.

**Case:** We present a case of a Multisystem LCH with unusual manifestations. A 19-year-old female had a two-year history of visual loss, polyuria and polydipsia, secondary amenorrhea, generalized maculopapular rashes and a sellar-suprasellar mass on MRI. She presented at the emergency room lethargic, drowsy and hypotensive. Laboratory tests showed hypernatremia, inappropriately low urine osmolarity for a high serum osmolarity, hypocortisolism, hypothyroidism and hypogonadism. A repeat cranial MRI showed a normal pituitary gland without any masses or signs of hydrocephalus. Contrast-enhanced CT-scan of the chest and abdomen showed pulmonary fibrosis, hepatomegaly and lytic lesions with soft tissue components in the iliac crest and mandible. Biopsy of the maculopapular lesions on the skin was positive for S100 and Cd1a, consistent with the diagnosis of Langerhans Cell Histiocytosis. She was then diagnosed with Multisystem LCH and was given Levothyroxine, Prednisone and Desmopressin. Chemotherapy was being planned for the patient, however, she succumbed to acute pulmonary embolism.

**Conclusion:** This case reports highlights the myriad and variable clinical presentation of LCH that could affect the work-up and management of adult patients with vanishing sellar-suprasellar mass and panhypopituitarism.
Fluconazole as a Viable Long-Term Alternative to Ketoconazole in Controlling Hypercortisolism of Recurrent Cushing’s Disease

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Ketoconazole has been a first-line agent for controlling hypercortisolism in Cushing’s Disease, however of late it is not widely available. As a result, fluconazole has been roped in as a viable alternative in view of its favourable safety profile.

A 50-year-old lady, developed recurrence of Cushing’s Disease after being in remission following transsphenoidal surgery (TSS) for a left pituitary microadenoma 16 years prior. Repeat MRI showed a right pituitary microadenoma (1.7 mm x 1.3 mm). She subsequently underwent a second TSS. However, she continued to have persistent hypercortisolism despite repeated MRIs showing absence of tumor recurrence. She refused bilateral adrenalectomy and radiotherapy. Ketoconazole was commenced at 200mg BID for disease control however this was hindered by intolerable side effects including pruritus and skin exfoliation. As a result, her disease continued unabated and she suffered a right basal ganglia hypertensive bleed. Treatment was subsequently switched to cabergoline and titrated to 0.5mg daily. Fluconazole 400mg daily was later added due to persistent disease. Her clinical and biochemical parameters improved markedly three months after the addition of fluconazole. No adverse event was reported. Her disease has remained stable for the last 15 months up to the time of the recent clinic review.

Rathke’s Cleft Cyst Presenting with Intractable Hyponatremia

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Introduction: Rathke’s Cleft cyst is a rare epithelial cyst which is confined to the sella turcica or extends into the suprasellar area. Hyponatremia is a rare documented presentation of Rathke’s Cleft Cyst and there were 10 reported cases.

Case: A 75-year-old male presented with hyponatremia intractable to intravenous saline solution correction. He subsequently developed seizure and decreased sensorium. He also developed hypotension despite fluid resuscitation and inotropics. Blood sugar was on the low normal level. Serum cortisol was low at 152 nmol/L (5.6 ng/dL). The thyroid function test showed FT3 2.88 pmol/L (3.1-5.2), FT4 9.07pmol/L (12-22), TSH 0.35UIU/mL (0.27-4.2). He was started on hydrocortisone and eventually the serum sodium was corrected. Blood pressure became stable and inotropics were tapered off. Canial MRI showed a 1.4 cm cystic appearing lesion within the suprasellar cistern, mildly indenting on the superior margin of the pituitary gland possibly Rathke’s Cleft Cyst. Patient refused surgery and was sent home ambulatory and conversant with no recurrence of seizure.

Discussion: Patients with symptomatic Rathke’s Cleft Cyst commonly present with headache, blurring of vision, and symptoms related to the compression of the optic chiasm, pituitary gland, hypothalamus and cavernous sinus. Patient may present with hormone deficiencies. In our patient, hyponatremia was due to hypocortisolism caused by Rathke’s Cleft Cyst indenting the pituitary gland. There was resolution of hyponatremia upon initiation of hydrocortisone.

Conclusion: It is important to rule out presence of endocrinopathies in patients with intractable hyponatremia. Surgery is the mainstay of treatment for Rathke’s Cleft Cyst.
P105
Growth Hormone Control and Cardiovascular Function in Patients with Acromegaly

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Objective: Acromegaly is associated with cardiovascular alterations. Up to 50% of acromegalic patients suffered from treatment failure after multiple modalities. We investigated correlation between cardiovascular function and control of growth hormone (GH) in acromegalic patients following transsphenoidal adenectomy (TSA).

Methodology: This cross-sectional study was conducted at a tertiary referral hospital. We recruited acromegalic patients who had undergone TSA between 2006 and 2014. Patients were assigned to group 1 comprising patients with controlled acromegaly (GH <2.0 ng/mL and normalized insulin-like growth factor-1 [IGF-1]), group 2 comprising patients with partially controlled acromegaly (either GH >2.0 ng/mL or non-normalized IGF-1), or group 3 comprising patients with uncontrolled acromegaly (either GH >2.0 ng/mL or non-normalized IGF-1). Echocardiography evaluated the left ventricular mass index, left ventricular ejection fraction, and the early transmitral filling velocity (E)-to-late transmitral filling velocity (A) and the E-to-the early diastolic mitral annular velocity (E') ratios. Carotid tonometry evaluated the intima-media thickness of the carotid artery, carotid femoral pulse wave velocity, augmentation index, aortic characteristic impedance, and pulse pressure amplification.

Results: The mean fasting GH and IGF-1 levels were significantly higher in group 3 than those in group 1 or group 2. The fasting GH level in group 2 was higher than that in group 1. The groups did not differ with respect to cardiovascular structure and function.

Conclusion: In the patients with acromegaly who had undergone TSA, cardiac structure and vascular stiffness did not differ among the groups with different levels of GH control.

P106
Hypopituitarism and Diffuse Large B-Cell Non-Hodgkin Lymphoma – A Case Report

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Objective: Hypopituitarism results from pituitary, hypothalamic or parasellar disease that disrupts normal pituitary function by displacing, infiltrating or destroying the hypothalamic-pituitary unit. Primary CNS lymphoma involving the hypothalamic-pituitary axis is exceedingly rare, accounting for 1-2% of Non-Hodgkin lymphoma (NHL). Systemic lymphoma metastasis to pituitary occurs in 5-29%, primarily NHL. Subtype diffuse large B-cell lymphoma (DLBCL) is the most common histology.

Methodology: We report clinical features, imaging and histology findings of a middle-aged man with hypopituitarism and DLBCL.

Results: A 66-year-old single male was admitted due to anorexia, nausea, general weakness, productive cough and shortness of breath for 3 days. He was pale, totally blind in both eyes, and had sparse axillary and pubic hair. Hemogram and blood biochemistry revealed normocytic anemia, hyponatremia and hypoglycemia. Chest X-ray showed prominent pulmonary hilum. An intra-abdomen mass entrapping great vessels was found on CT scan. Lymphoma is considered. A deep ulcer surrounding with rigid mucosa in the posterior wall of cardia was noticed in endoscopic exanimation. Biopsy from the lesion confirmed the diagnosis of NHL, DLBCL type. Pituitary function was evaluated and results confirmed central hypothyroidism, central adrenal insufficiency and hypogonadotropic hypogonadism.

Conclusion: Hypopituitarism and DLBCL was a rare clinical association. Regrettfully, the patient was totally blind since age 5 and had claustrophobia, visual field examination and cranial MRI can not be performed to further investigate the causal relationship. This case demonstrates that recognition of lymphoma infiltration to pituitary is important as it is one of the potential causes of hypopituitarism.
**P107**

**Diabetes Insipidus as the initial presenting symptom in an Adult with Langerhans Cell Histiocytosis**

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There is paucity of information on Langerhans Cell Histiocytosis (LCH) in adults because of its rarity in this age group. We report a case of Central Diabetes insipidus as the initial presentation in an adult patient with LCH. To our knowledge, this is the 2nd adult case of LCH presenting with Diabetes insipidus reported in literature in the Philippines.

A 27-year-old female presented with polyuria and polydipsia, initially thought to be part of normal pregnancy, however symptoms did not improve post-partum. She deferred consult until she developed recurrent headaches associated with left hemifacial anesthesia 7 years later. Initial CT scan showed left parietal calvarial tumor, no other intracranial lesion was reported. Diabetes mellitus was excluded during this time. Cranietomy, excision of the tumor and cranioplasty was carried out. Histopathology and immunostaining with S100 and CD1a confirmed the diagnosis of Langerhans Cell Histiocytosis. Central diabetes insipidus was confirmed after water deprivation test and patient was maintained on Desmopressin with improvement in polyuria. Subsequent endocrine workup revealed isolated hypothyroxinemia. Thyroxine levels improved after initial courses of chemotherapy.

Langerhans cell histiocytosis (LCH) is a rare disorder of granulomatous deposition at multiple sites within the body known to involve the hypothalamo-pituitary axis (HPA). In particular, development of diabetes insipidus may precede the diagnosis of LCH by years in some reported cases. In the absence of reported lesion in the HPA in imaging, it is prudent to include workup of anterior pituitary hormone to rule out other deficiencies which could contribute to its symptomatology.

**P108**

**Case Series of Three Patients with Giant Prolactinoma Requiring Multimodal Therapy**

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**Introduction:** A giant prolactinoma (GP) is defined as pituitary adenoma with diameter 4 cm or more, with extra-sellar extension causing clinical symptoms and serum prolactin (PRL) > 1000ug/l (21 000mIU/L). This rare pituitary macroadenoma represents about 4% of prolactinomas, can be highly invasive, often presenting with acute neurological complications and might require multimodal therapy apart from dopamine agonists (DA).

**Objectives:** We describe presenting clinical and radiological features, therapeutic management and clinical response of 3 cases with GP.

**Methodology:** Retrospective data collection of three cases with GP encountered in the past one year.

**Results:** All three patients were men aged between 23 to 55 years, presenting with severe headache and visual disturbance. One patient presented with meningitis followed by incidental finding of large sellar mass. The tumor size ranged from 4.0 to 6.0 cm in diameter with baseline PRL 42 553 to 988 346 mIU/L. All three patients were on DA, cabergoline (CBG). One patient had surgery prior to DA whereas two other cases required surgical intervention following medical therapy for CSF leak and worsening visual impairment respectively. Two patients responded well to DA whilst the other one patient required chemotherapy, temozolamide for persistent hyperprolactinemia with residual macroadenoma after two surgeries and high dose CBG 7.5 mg/week, which successfully reduced PRL and tumor size significantly. All three had secondary hypothyroidism, secondary adrenal insufficiency and secondary hypogonadism, with diabetes insipidus in two patients.

**Conclusion:** These three cases illustrate the challenges and complexity of management of GP and emphasize the need for multidisciplinary management and multimodal treatment.
**P109**

**Association Between insulin Resistance and Metabolic Syndrome In Women With Polycystic Ovary Syndrome**

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**Background:** As emerging epidemic of Type 2 DM and obesity are growing all over the world, earlier detection of insulin resistance becomes preventive strategy. One condition commonly detected among young obese women with increased risk of diabetes is polycystic ovary syndrome. Interestingly, features of metabolic syndrome, insulin resistance, obesity and dyslipidaemia are also present in Polycystic Ovary Syndrome.

**Objective:** Aim of the study was to find an association between insulin resistance and metabolic syndrome in women with PCOS.

**Methodology:** Study was cross-sectional Yangon General hospital based analytical study carried out between January 2012 to March 2013. PCOS cases were referred from fertility centre and obstetric unit to endocrinology department. Sixty-seven PCOS cases diagnosed by Rotterdam 2003 consensus criteria were included in the study. Demographic characteristics were noted and tested for fasting insulin, fasting blood sugar and fasting lipid profile to assess Insulin resistance and metabolic syndrome. Insulin resistance was measured by HOMA IR and metabolic syndrome was assessed by (AHA/NHLBI 2005) criteria.

**Results:** Insulin resistance(IR) was found in 40 cases (59.7%) and metabolic syndrome (Met S) was present in 33 cases (49.2%). Major risk factors of Met S like raised BMI, central obesity, high blood pressure, high fasting blood sugar and raised triglycerides, were significantly different between PCOS with and without Metabolic syndrome. When looking into association of risks and Insulin resistance, high fasting insulin, high triglycerides and waist circumference were strongly associated.

**Conclusion:** There was significant association between IR and Met S among PCOS women in this study.

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**P110**

**Carvacrol Inhibits Angiogenesis and Endothelial Dysfunction in Human Umbilical Vein Endothelial Cells**

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*Daegu University, Kyungsan City, Kyungbook, South Korea*

**Objective:** An adequate nutrient and substrate supply is essential for normal intrauterine development of the fetus. Disturbances in uterine blood supply are associated with higher perinatal morbidity and mortality caused by preterm delivery, pre-eclampsia or intrauterine growth restriction. Adaptation of the uterine vasculature to the rising needs of the fetus occurs through both vasodilation and development of new vessels. Angiogenesis is the process of neovascularization from pre-existing blood vessels in response to hypoxia or substrate demands of tissues. It is important to find natural drug against angiogenesis.

**Methodology:** In this study we have used HUVECs (Human Umbilical Vein Endothelial Cells) which shows the angiogenesis and carvacrol, a monoterpenoid, an anti-angiogenic agent. To detect the anti-angiogenic activity of carvacrol determined with the help of MTT and LDH assay. Further wound healing assay observed with the help of scratch assay. Molecular marker levels determined with the help of MAP kinase, NFκB, MMPs and VEGF.

**Results:** Carvacrol causes dose dependent (25, 50 and 80μM) decrease in cell viability of HUVECs. Carvacrol found to be causing the anti-wound healing activity determined with the help of scratch assay. Moreover, we found the dose dependent inhibition of MAP kinase pathway evaluated with the help of western blotting. In addition, we have found reduced levels of NFκB, MMPs and COX-2 protein expression in HUVECs.

**Conclusion:** Therefore, our result suggests that carvacrol could be used as a potential treatment for the angiogenesis development during pregnancy.
P112
Hemorrhagic Necrosis of Small Bowel Following Small Bowel Obstruction as a Late Complication of Sex Reassignment Surgery – A Gap in Transgender Care

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Introduction: For decades, Thailand has been at the forefront of sex reassignment surgeries (SRS). The neo-vagina created by recto-sigmoid vaginoplasty is a much more complex procedure when compared with penile skin version technique, but yielded more satisfactory functional outcomes. We report an unusual case of life-threatening small bowel obstruction following previously successful recto-sigmoid vaginoplasty in a transgender woman.

Case: A 28-year-old Thai transgender woman presented to the emergency room with acute periumbilical pain and then developed hematochezia with hypovolemic shock 12 hours later after admission. The patient had undergone male to female gender reassignment surgery (recto-sigmoid vaginoplasty) 18 months earlier at another hospital but patient was lost to follow-up after 1 year. Physical exam demonstrated marked abdominal distension and tenderness. Hemoperitoneum was detected from ultrasound-guided paracentesis. Exploratory laparotomy revealed 100-cm hemorrhagic necrosis of a segment of jejunum secondary to post-surgical fibrous adhesions with approximately 2,000 ml of blood in the abdominal cavity. Postoperatively, the patient remained well without immediate complications.

Conclusion: Transgender individuals have unique healthcare needs. However, various gaps still exist to provide multi-disciplinary care for these patients. The rate of adhesive small bowel obstruction is highest in the early period of any intra-abdominal postoperative surgeries, but the risk remains life-long. Transgender women receiving complicated vaginoplasty should be instructed to continue long-term follow-up to ensure early detection and management of post-surgical complications. Improved awareness of the complications after sex reassignment surgeries among patients and health care providers should be emphasized to optimize positive outcomes for transgender care.

P113
PTU-induced Agranulocytosis Coinciding with Systemic Lupus Erythematosus in Graves’ Disease

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Introduction: Graves’ disease is a frequent cause of hyperthyroidism. Mainstay treatment options include antithyroid drugs (ATDs) such as propylthiouracil (PTU). While most side-effects of ATDs like arthralgias and rashes are considered minor, agranulocytosis is a rare but life-threatening reaction that warrants immediate discontinuation of the offending drug. Agranulocytosis may manifest with fever, malaise, mucosal ulcers and rashes. The clinical manifestations of adverse reactions to ATDs closely resemble the manifestations of systemic lupus erythematosus (SLE), which may be missed out in patients with pre-existing Graves’ disease and presumed to be ATD-induced adverse reaction.

Case: We report the case of a 33-year-old female who presented with an anterior neck mass, proptosis, easy fatigability and palpitations in 2011, for which PTU was given. One week prior to admission, she developed rashes, joint pain, abdominal pain and vomiting. Tests revealed agranulocytosis, prompting discontinuation of PTU. Closer examination of her rashes revealed that they were discoid in character with follicular plugging, which led us to examine the possibility of SLE. Indirect immunofluorescence anti-nuclear antibody was positive while antihistone was negative. She underwent radioactive iodine ablation for hyperthyroidism, and was given high dose glucocorticoids. White blood cell counts improved without the use of granulocyte colony stimulating factor and she was eventually discharged.

Conclusion: Awareness of the simultaneous occurrence of an autoimmune thyroid disorder with another systemic autoimmune disease serves to broaden our differential diagnoses in patients with this presentation. This helps us recognize chronic diseases that need specialized care.
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<td>ACTH</td>
<td>adrenocorticotrophic hormone</td>
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<td>ALP</td>
<td>alkaline phosphatase</td>
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<td>alanine aminotransferase</td>
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<td>anti-TPO</td>
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<td>AOG</td>
<td>age of gestation</td>
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<td>aOR</td>
<td>adjusted odds ratio</td>
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<td>aspartate aminotransferase</td>
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<td>AUC</td>
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<td>BMD</td>
<td>bone mineral density</td>
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<td>blood pressure</td>
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<td>Ca</td>
<td>calcium</td>
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<td>CAD</td>
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<td>CEA</td>
<td>carcinoembryonic antigen</td>
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<td>CI</td>
<td>confidence interval</td>
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<td>CKD</td>
<td>chronic kidney disease</td>
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<td>cm</td>
<td>centimeter</td>
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<td>DM</td>
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<td>ELISA</td>
<td>enzyme-linked immunosorbent assay</td>
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<td>ESRD</td>
<td>end-stage renal disease</td>
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<tr>
<td>FBS or FPG</td>
<td>fasting blood glucose or fasting plasma glucose</td>
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<tr>
<td>FT3</td>
<td>free triiodothyronine</td>
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<td>free thyroxine</td>
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<td>GDM</td>
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<td>GH</td>
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<td>human leukocyte antigen</td>
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<td>HR</td>
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<td>ICU</td>
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<td>IDF</td>
<td>International Diabetes Federation</td>
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<td>IGF-1</td>
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<td>IR</td>
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<td>m</td>
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<td>MEN-2A</td>
<td>multiple endocrine neoplasia type 2A</td>
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<td>OGTT</td>
<td>oral glucose tolerance test</td>
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<td>OR</td>
<td>odds ratio</td>
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<td>P</td>
<td>phosphate</td>
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<td>PA</td>
<td>primary aldosteronism</td>
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<td>PAS</td>
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<td>PET-CECT</td>
<td>positron emission tomography contrast-enhanced computerized tomography</td>
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<td>PPG</td>
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<td>PTC</td>
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<td>PTH</td>
<td>parathyroid hormone</td>
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<td>PTU</td>
<td>propylthiouracil</td>
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<td>RAI</td>
<td>radioactive iodine</td>
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<td>RCT</td>
<td>randomized controlled trial</td>
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<tr>
<td>RR</td>
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<tr>
<td>SGLT2i</td>
<td>sodium glucose cotransporter 2 inhibitor</td>
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<td>SMPG</td>
<td>self-monitored plasma glucose</td>
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<td>T1DM</td>
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<td>TC</td>
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<td>TG</td>
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<td>TRAb</td>
<td>anti-thyroid receptor antibodies</td>
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<td>TS</td>
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<td>TSH</td>
<td>thyroid stimulating hormone</td>
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<td>VMA</td>
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<tr>
<td>18-FDG</td>
<td>F-18 fluoro-deoxyglucose</td>
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<td>25(OH)D</td>
<td>25-hydroxy vitamin D</td>
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20th AFES Congress 2019
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