

PP-D-22

EFFECT OF HEMATOCRIT LEVELS ON HbA1c VALUES IN THE ENDEMIC AREA OF HEMOGLOBINOPATHY

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INTRODUCTION

The utility of HbA1c may be limited due to inaccuracies in patients with hemoglobinopathy. This study aims to determine the relationship between Dtx and HbA1c levels to assess the need for control of DTx to achieve HbA1c targets in populations with hemoglobinopathy.

METHODOLOGY

This is a cross-sectional study that was conducted at Surin Hospital. All the data from 2016 to 2018 were analyzed for the association between variables that may affect HbA1c.

RESULTS

Of all the 704 patients enrolled in this study, 347 patients had negative DCIP, 204 patients had HbEA and 153 patients had HbEE. In the analysis of the relationship between Hct and HbA1c, a linear association was found. Patients with high Hct also had higher levels of HbA1c. The univariable analysis found a similar relationship between the HbEA and the control group ($Y = 5.14 + 0.017 \text{ Dtx}$, R-squared = 0.1970 and $Y = 4.44 + 0.020 \text{ Dtx}$, R-squared = 0.3288, respectively). However, the steepness of the relationship is less steep for the HbEE group at $Y = 5.43 + 0.011 \text{ Dtx}$, R-squared = 0.1744. Furthermore, Hct was found to be weakly associated with HbA1c levels, at $Y = 5.5 + 0.055 \text{ Hct}$ and R-square = 0.0243 or 2.43%, which is highly significant at $p < 0.001$. In addition, exploratory model multivariable analysis separating all variables to become independent found that the type of hemoglobin does not affect HbA1c. Hence, the equation derived from multivariable regression analysis is $Y = 2.88 + 0.016 \text{ DTx} + 0.05 \text{ Hct}$.

CONCLUSION

Suggesting that HbA1c levels are affected by Hct levels, in addition to Dtx. The eHbA1c is used to estimate the level of DTx for individual self-control by patients with altered blood concentrations.

KEYWORDS

hemolytic anemia, hemoglobin E homozygote, glycosylated hemoglobin, HbA1c, estimate HbA1c

PP-D-23

IDENTIFYING RISK FACTORS RELATED TO PROGRESSIVE KIDNEY FAILURE IN HIGH-HEMATOCRIT, NORMAL-HEMOGLOBIN DIABETES PATIENTS SEEN IN SURIN HOSPITAL IN THAILAND

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INTRODUCTION

Diabetes is now the most common cause of end-stage renal disease (ESRD). This research aims to study the rate of decline in estimated glomerular filtration rate (eGFR) and risk factors related to progressive renal failure in high-hematocrit, normal-hemoglobin diabetic patients in Surin Hospital, Thailand.

METHODOLOGY

This case-control cohort study was conducted from 2009 to 2020. The patients' general clinical information, fasting plasma glucose (FPG), HbA1c levels, hematocrit (Hct), and eGFR were collected and divided into two groups; hematocrit higher than 42% (study group) and normal hematocrit level (hematocrit 36.1-40.0%, control group). The patients with confirmed diabetes were treated either with insulin, oral hypoglycemic drugs, or a physician-prescribed diet. The target of diabetes control follows standard treatment, not intensive control. The endpoint was a rate of decline of eGFR per year. The hypothesis was that the cumulative average duration of disease was equal, and the renal complications between the two groups were not different.

RESULTS

From 2009 to 2020, there were 216 diabetic patients with 108 males (50%) included. A total of 1870 blood tests were done, 1248 (67%) in the study group and 622 (33%) in the control group. There were no significant differences concerning mean cholesterol (CHO) among the groups. The mean age and eGFR were significantly lower in the study group. The males in the study group had significantly higher mean systolic blood pressure (SBP), diastolic blood pressure (DBP), fasting plasma glucose (FPG), hemoglobin A1c (HbA1c), triglyceride (TG), high-density lipoprotein (HDL), low-density lipoprotein (LDL), serum creatinine (Cr), and duration of disease were significantly higher. The rate of decline in eGFR was significantly slower in the control group, at $-0.134 \text{ ml/min/year}$ ($p < 0.689$) and $-0.778 \text{ ml/min/year}$ in the study group ($p < 0.008$).

CONCLUSION

In a long-term cohort study, the high-hematocrit and normal-hemoglobin groups had faster progression to renal failure. Diabetic patients with high hematocrit levels should be monitored using HbA1c levels as an indicator for long-term glycemic control and may need intensive risk control.

KEYWORDS

diabetes mellitus, high hematocrit, normal hemoglobin, diabetic nephropathy, Surin Hospital

PP-D-24

EFFECTIVENESS OF A STRUCTURED TRI-PHASIC INTENSIVE WEIGHT MANAGEMENT PROGRAMME ON DIABETES REMISSION IN MULTI-ETHNIC ASIANS: AN INTERIM ANALYSIS

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INTRODUCTION

Evidence from the primary care-led United Kingdom Diabetes Remission Clinical Trial (DiRECT) demonstrated that type 2 diabetes mellitus (T2D) can be reversible through an intensive, very low-calorie diet (VLCD)-based weight management programme. The structured programme comprised three phases: total diet replacement (Phase 1: ~3 months), food reintroduction (Phase 2: ~2 months) and weight maintenance (Phase 3: up to ~24 months). The generalizability of the findings to the Asian populations is unclear, given the distinctiveness of the Asian diabetes phenotype. Modeled after the DiRECT programme, we evaluated the effectiveness of the tri-phasic approach in weight loss and diabetes remission among multi-ethnic Asians with T2D.

METHODOLOGY

Since July 2022, T2D patients have been recruited into the programme at a secondary care diabetes centre in the northern region of Singapore. The inclusion criteria were age 21-65 years, clinically diagnosed with T2D, diabetes duration of 0-6 years, HbA1c $\geq 6\%$ (on glucose-lowering medications) or $\geq 6.5\%$ (on diet control), body mass index (BMI) of 27-45 kg/m² and no insulin use. The prescribed energy intake was 800 kcal (Phase 1), 1000 kcal (Phase 2) and 1200-1500 kcal (with exercise; Phase 3) per day. All glucose-lowering medications were stopped at programme initiation. The monthly percentage of total weight loss (%TWL) was calculated. Real-time glucose levels were monitored for 14 days from the initiation of each phase using the FreeStyle Libre system. Diabetes remission, defined as HbA1c $< 6.5\%$ and fasting plasma glucose < 7 mmol/L off glucose-lowering medications for at least 3 months, was assessed at the end of Phase 1 and Phase 2.

RESULTS

At the time of analysis, 16 patients (age: 34 ± 7 years, 68.8% men, BMI: 35.1 ± 4.2 kg/m²) with a median diabetes duration of 2 years and mean baseline HbA1c of $6.94 \pm 1.40\%$ were enrolled into the programme, of which 12 and 11 of them had Phase 1 and Phase 2 data, respectively. A median daily Libre glucose reading of < 7.0 mmol/L was recorded on Day 3 of VLCD without medications. On Phase 1 completion, body weight had dropped from baseline 103.2 to 94.0 kg ($p = 0.003$), achieving 8.5% TWL. Additionally, levels of HbA1c, triglycerides, and liver enzyme decreased while uric acid increased significantly (all $p < 0.05$). Seventy-five percent ($n = 9/12$) of patients experienced diabetes remission. All patients who attained $\geq 10\%$ TWL ($n = 5$) had diabetes remission. Notably, the non-remitters in the $< 5\%$ TWL ($n = 2/5$) and 5-9.9% TWL ($n = 1/2$) categories displayed relatively good glycemic control despite modest weight loss. At the end of Phase 2 (food reintroduction), mean weight had increased moderately from 94.0 to 98.4 kg ($p = 0.003$), corresponding to 4.3% TWL. Generally, the median daily glucose levels were kept within normal range during Phase 2. The diabetes remission rate decreased to 63.6% ($n = 7/11$), attributed to one patient with $< 5\%$ TWL experiencing a diabetes relapse. Two patients shifted from the $\geq 10\%$ TWL category to the 5-9.9% TWL category, but they remained in remission.

CONCLUSION

The short-term interim results show that Asians respond favorably to the weight management programme, achieving a high diabetes remission rate that is comparable to that of bariatric surgery, albeit having a variable degree of weight loss. However, longer observation is required to ascertain the sustainability of diabetes remission.

KEYWORDS

type 2 diabetes, weight loss, diabetes remission, very low-calorie diet