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DIAGNOSTIC ACCURACY OF SERUM 1,5-ANHYDROGLUCITOL AS A SURROGATE MEASURE OF GLYCEMIC VARIABILITY AMONG ADULT FILIPINOS WITH TYPE 2 DIABETES MELLITUS: A RETROSPECTIVE CROSS-SECTIONAL STUDY

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INTRODUCTION
Glycemic variability increases the risk of the development of microvascular and macrovascular complications from diabetes mellitus. Currently, available metrics used to measure glycemic variability are derived from continuous glucose monitoring (CGM) data namely mean amplitude of glycemic excursion (MAGE), continuous overlapping net glycemic action at 1-hour intervals (CONGA-1), and mean of daily differences (MODD). Serum 1,5-anhydroglucitol (1,5-AG) as a biomarker of glucose fluctuations is a practical, cheaper, and surrogate measure of glycemic variability as compared to CGM. This study aims to determine the diagnostic accuracy of 1,5-AG in relation to the glycemic variability metrics derived from CGM as a surrogate measure of glycemic variability among adult Filipinos with type 2 diabetes mellitus (DM).

METHODOLOGY
Retrospective data analysis of 37 adult patients aged 20 years and above diagnosed with type 2 diabetes mellitus referred for CGM at the Diabetes, Endocrine, Metabolic, and Nutrition Center of Cardinal Santos Medical Center from January 2017 to October 2021 who underwent serum 1,5-AG level determination within 2 weeks of CGM were collected. Criteria for exclusion include (1) the presence of acute infection at the time of the study; (2) the presence of active malignancy or end-stage cardiac, pulmonary, hepatic, and renal diseases; (3) medications that could alter glomerular function (i.e., ACE inhibitor, SGLT-2 inhibitor).

RESULTS
There was good diagnostic accuracy between serum 1,5-AG levels with the different measures of glycemic variability derived from CGM namely MAGE, CONGA-1, and MODD with significant correlation among patients with HbAlc level ≤7%. Subjects were on CGM for approximately 6 ± 1 day with statistical significance between the good glucose control (HbA1c ≤7%), acceptable glucose control (HbA1c 7.1-8%), and poor glucose control group (HbA1c >8%) (p <0.05).

Determination of diagnostic accuracy between 1,5-AG and MAGE showed a good accuracy (Sensitivity 95.3%, specificity 100%, positive predictive value (PPV) 100%, negative predictive value (NPV) 75.43%, diagnostic accuracy 96%, and a Youden Index (YI) of 92.3) with a statistically significant correlation among subjects with HbA1c level ≤7% (p = 0.021). There is likewise good diagnostic accuracy between CONGA-1 and 1,5-AG level (Sensitivity 99%, specificity of 75.29%, PPV 89.1%, NPV 97%, Accuracy 89.50%, and YI of 58.41) with a statistically significant correlation among subjects with HbA1c ≤7% (p = 0.038). Comparison with interday glycemic variability showed fair diagnostic accuracy between MODD and 1,5-AG (Sensitivity 79.17%, specificity of 78%, PPV of 97%, NPV of 32%, Accuracy 76.89%, and YI of 49.07) and a statistically significant correlation among subjects with ≤7% (p = 0.009).

CONCLUSION
There is good diagnostic accuracy of serum 1,5-AG levels with the different measures of glycemic variability derived from CGM namely MAGE, CONGA-1, and MODD with significant correlation among patients with HbA1c level ≤7%. Among diabetics with HbA1c ≤7%, 1,5-AG could be used as a surrogate measure of glycemic variability and excursions.

KEYWORDS
continuous glucose monitoring, MAGE, CONGA-1, MODD. Serum 1,5-anhydroglucitol