Variations in the Prevalence of Gestational Diabetes Mellitus With Remote Testing and a Pragmatic Solution to Improve Accuracy

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Diabetes Care 2021;44:e4–e5 | https://doi.org/10.2337/dc20-2211

A recent article (1) and Commentary (2) in *Diabetes Care* have raised issues with respect to the method of handling blood samples for oral glucose tolerance tests (OGTT) and the prevalence of gestational diabetes mellitus (GDM). Many Australian sites continue to rely solely on collection tubes containing fluoride for stabilization of glucose. In outback Australia, this is a very real issue.

We previously estimated a two- to threefold increase in GDM prevalence in rural and remote Australia had the Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study preanalytical protocol been used (from 10.8 to 28.5% [95% CI 20.8–29.5%]) (3). The impact of glycolysis is likely exacerbated in remote compared with urban settings due to greater distances to the laboratory—up to 650 km (400 miles) in our study (3).

Centrifugation within 10 min of sample collection can achieve glucose profiles similar to those with the HAPO study preanalytical protocol (3). Potter et al. (1) found a 1.8-fold increase in GDM prevalence after pathology laboratory collection centers implemented immediate centrifugation in a predominantly urban Australian setting. However, many rural and remote sites in our study conducted OGTT in the antenatal clinic, either due to a lack of local collection center or to optimize OGTT completion. Aside from the issue of a lack of access to equipment, immediate centrifugation cannot be guaranteed in the clinic setting and places additional time constraints on antenatal care staff.

Fluoride-citrate (FC) tubes immediately stabilize glucose and present a practical solution for rural and remote settings. However, FC tubes give 0.2 mmol/L (3.6 mg/dL) higher plasma glucose readings compared with the HAPO study preanalytical protocol (3), raising concerns of increased GDM burden with use of the International Association of the Diabetes and Pregnancy Study Groups (IADPSG) criteria (3,4). We estimated a substantial increase in GDM using FC tubes (45.3% [95% CI 35.7–55.1]) (3), and increased identification of women with lower incidence of adverse birth outcomes (E.L.J., E.P.S., A.B.K., C.R., D.N.A., J.V.M., unpublished observations). Similarly, Song et al. (4) estimated that FC tube use could potentially lead to inappropriate labeling of women as having GDM in a low-risk regional Australian cohort.

To counter this apparent "overdiagnosis," we suggest modification of the IADPSG diagnostic criteria by an increase of 0.2 mmol/L for use with FC tubes. Criteria modification lowered the estimated FC tube GDM incidence (30.3%) in line with HAPO study preanalytical protocol estimates for our cohort and improved identification of pregnancies at risk for large-for-gestational-age newborns (E.L.J., E.P.S., A.B.K., C.R., D.N.A., J.V.M., unpublished observations); estimated risk was similar to the unadjusted relative risk of 1.95 observed in the retrospective HAPO study cohort analysis (5). For avoidance of clinician confusion, it may be preferable for clinical laboratories to apply a systematic postanalytical correction factor to assay results from FC tubes prior to reporting rather than use of revised diagnostic criteria; Potter et al. also proposed postanalytical correction based on the positive glucose bias alone.

We agree that minimization of glycolysis in OGTT samples should be a major priority for maternity services (1). For rural and remote settings, modified IADPSG criteria or application of a postanalytical correction factor for use with FC tubes would provide a pragmatic, common sense approach to testing and a realistic GDM prevalence.

Acknowledgments. The authors thank all clinical investigators who made substantial contributions to the study referenced here (e.g., study design and participant recruitment) but who do not meet the criteria for authorship. The authors acknowledge all project managers, antenatal care providers, and

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Received 4 September 2020 and accepted 24 September 2020

administrative staff from all participating clinics and all study participants. The authors acknowledge the laboratory support from PathWest for the original paired sample analysis used to derive the algorithms to adjust for glycolysis.

Funding. This study was cofunded by grants from The Rural Clinical School of Western Australia, The University of Western Australia (PG 63000694), Lishman Health Foundation (PG 63000695), and Diabetes Australia (Y17G-MARJ). E.L.J. is supported by an Australian Government Research Training Program Stipend and The University of Western Australia Safety Net Top-Up Scholarship.

Duality of Interest. No potential conflicts of interest relevant to this article were reported.

Author Contributions. J.V.M., D.N.A., A.B.K., and C.R. contributed to conception and design of the study. E.L.J., E.P.S., A.B.K., J.V.M., D.N.A., and C.R. contributed to acquisition of data. E.L.J., J.V.M., A.B.K., D.N.A., and C.R. contributed to analysis and/or interpretation of data. E.L.J. and J.V.M. drafted the manuscript. J.V.M., A.B.K., D.N.A., C.R., and E.P.S. revised the manuscript critically for important intellectual content. E.L.J., E.P.S., A.B.K., C.R., D.N.A., and J.V.M. approved the version of the manuscript to be published. E.L.J. and J.V.M. are the guarantors of this work and, as such, had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Prior Presentation. Parts of this study were presented in abstract form at the Australasian Diabetes in Pregnancy Society Annual Scientific Meeting, Adelaide, Australia, 24–26 August 2018; the 7th Annual National Health and Medical Research Council Symposium on Research Translation, Sydney, Australia, 27–28 November 2018; the 10th International Symposium on Diabetes, Hypertension, Metabolic Syndrome & Pregnancy (DIP 2019), Florence, Italy, 29 May–1 June 2019; and the International Diabetes Federation Congress 2019, Busan, Republic of Korea, 2–6 December 2019.

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