Author/s:
Janus, E;Dunbar, J

Title:
Nomograms for incident risk of post-partum type 2 diabetes in Chinese women with gestational diabetes

Date:
2019-03-01

Citation:
Janus, E. & Dunbar, J. (2019). Nomograms for incident risk of post-partum type 2 diabetes in Chinese women with gestational diabetes. Clinical Endocrinology, 90 (3), pp.415-416. https://doi.org/10.1111/cen.13904.

Persistent Link:
https://hdl.handle.net/11343/284981

Article type : 8 Requested Commentary

Invited Commentary

Nomograms for incident risk of postpartum type 2 diabetes in Chinese women with gestational diabetes

Running title: Nomograms for post partum diabetes

***Edward Janus[1,2] and [3]James Dunbar**

[1]General Internal Medicine Unit, Western Health, St Albans, VIC, Australia

[2]Department of Medicine – Western Health, The University of Melbourne, Melbourne, Australia.

[3]Deakin Rural Health, School of Medicine, Faculty of Health, Deakin University, Warrnambool Campus, PO Box 423, Warrnambool, Vic 3280

***Corresponding author edwarddj@unimelb.edu.au**

Worldwide the prevalence of type 2 diabetes (T2D) is increasing. Using the 2010 ADA criteria, the burden for China is already especially high.[1] Gestational diabetes mellitus (GDM) is one of the major predictors of subsequent diabetes. A systematic review assessed the risk as seven-fold but the studies were heterogenous.[2] Incidence varies with

socioeconomic status and ethnicity.[3] There is evidence from the US Diabetes Prevention Program that lifestyle modification or metformin can reduce progression to T2D.[4]

Although there are a number of risk predictors for the general population there are no tools to predict postpartum T2D among women who have had GDM.[5]

In this issue of Clinical Endocrinology Li Weiqin and colleagues present nomograms for incident risk of developing T2D after earlier GDM. Nomograms are a simple visual aide to explain the risk to women so that those at high risk can be targeted for intervention - an important endeavour.[6]

In their study they use the 1998 WHO criteria for diagnosis of GDM.[7] Women with a 75g oral glucose tolerance test confirming either diabetes (fasting glucose $\geq$7.0mmol/l or 2 hour glucose $\geq$ 11.1) or impaired glucose tolerance (IGT = 2 hour glucose $\geq$7.8 and <11.1) were regarded as having GDM. Of the 1263 women with GDM 114 had diabetes and 1149 IGT.

At 2.3 years postpartum, 83 of the 1263 women were diagnosed with T2D. Independent predictors of later post partum T2D included family history of diabetes, history of pregnancy induced hypertension, pre-pregnancy BMI and the 2 hour glucose in the OGTT at 26-30 weeks. An easy to use nomogram was produced with an overall AUROC of 82.8%. Treatment with insulin was not mentioned as a risk factor.

There was no testing in the early 6-8 weeks postpartum period to ascertain if they had returned to normoglycaemia. Perhaps some had pre-existing T2D first found in pregnancy clearly a limitation to the accuracy of the nomogram.

A further limitation is that the criteria for diagnosis of GDM have changed following the Hyperglycaemia and Adverse Pregnancy Outcomes (HAPO) study in which foetal outcomes rather than longer term maternal development of T2D were the drivers for the glucose criteria.[8] The new 2014 International Association of Diabetes and Pregnancy Study Groups (IADPSG) guidelines' criteria, which considerably increase the number of women diagnosed with GDM, are for universal glucose tolerance testing at 24-28 weeks and a diagnosis of GDM is made by 75 g OGTT and fasting 5.1mmol/l, 1 hour 10.0mmol/l, 2 hour 8.5mmol/l.

We don't know the conversion rates to later T2D for women diagnosed with GDM using these lower thresholds but they are likely to be lower. We will now need newer predictive nomograms for these women.

A further challenge is effectiveness of lifestyle modification interventions in the real world rather than the efficacy shown in the high-resource, individually targeted Randomised Controlled Trial.[4] Recent studies show lesser degrees of weight loss and predict lesser degrees of reduction in progression to T2D.[9]

Uptake of follow up testing and of lifestyle interventions by women who have completed their pregnancy and in many cases have returned to normoglycaemia has also been low as shown by Australian studies which captured women with GDM and prompted follow up testing.[9,10]

All this important work to identify those women with GDM who will develop T2D and to effectively follow them up with practical interventions which reduce progression to T2D needs to continue. This is clearly challenging and will also require country specific approaches as Li Weiqin and colleagues state.

References

1. Xu Y, Wang L, He J, et al. Prevalence and control of diabetes in Chinese adults. *JAMA.* 2013; 310(9):948-059.
2. Bellamy L, Casas JP, Hingorani AD, Williams D. Type 2 diabetes mellitus after gestational diabetes: a systematic review and meta-analysis. *Lancet* 2009;373:1773-1779.
3. Abouzeid M, Philpot B, Janus ED, Coates MJ, Dunbar JA. Type 2 diabetes prevalence varies by socioeconomic status and between migrant groups: analysis and implications for Australia. *BMC Public Health* 2013;13:252.
4. Ratner R, Christophi C, Metzger B et al. Prevention of diabetes in women with a history of gestational diabetes: effects of metformin and lifestyle interventions. *J Clin Endocrinol Metab* 2008; 93(12);4774-4779.
5. Collins GS, Mallett S, Omar O, Yu LM. Developing risk prediction models for type 2 diabetes: a systematic review of methodology and reporting. *BMC Medicine.* 2011; 9:103…

6. Li WQ, Leng JH, Liu HK, Zhang S, Wang L, Hu G et al. Nomograms for incident risk of postpartum type 2 diabetes in Chinese women with prior gestational diabetes. *Clinical Endocrinology* ……..
7. Alberti KG, Zimmet PZ. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus provisional report of a WHO consultation. *Diabetic Medicine* 2011; 28(6):652-657.
8. Metzger BE, Gabbe SG, Persson B, Buchanan TA, Catalano PA, Damm P et al. International Association of Diabetes and Pregnancy Study Groups Recommendations on the Diagnosis and Classification of Hyperglycaemia in Pregnancy. *Diabetes Care*. 2010; 33(3):676-82.
9. O'Reilly SL, Dunbar JA, Versace V, Janus E, Best JD, Carter R, et al. MAGDA Research Group Mothers after Gestational Diabetes in Australia (MAGDA): A Randomised, Controlled Trial of a Postnatal Diabetes Prevention Program. *PLoS Med*. 2016; 13(7): e1002092.doi:10
10. Boyle DIR, Versace VL, Dunbar JA, Scheil W, Janus ED, Oats JJN et al. Results of the first recorded evaluation of a national gestational diabetes mellitus register; Challenges in screening, registration, and follow up for diabetes risk. PLoS ONE13(8):e0200832. https://doi.org/10.1371/journal.pone.0200832