

# Pre-eclampsia and gestational diabetes mellitus are associated with an increased risk of cardiovascular disease

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Dear Dr Papageorgiou,

We read with great interest the article published in BJOG by Hildén et al.<sup>1</sup>, in which the authors aimed to investigate if the pre-eclampsia association with cardiovascular disease (CVD) was independent of gestational diabetes mellitus (GDM). They indicated that pre-eclampsia and GDM were independent risk factors for CVD, and after stratifying by maternal body mass index (BMI), the adjusted association of pre-eclampsia with CVD did not differ notably between BMI groups. They concluded that pre-eclampsia and GDM were independent risk factors for later CVD and having both during pregnancy was a major risk factor for later CVD. Furthermore, they indicated that the association between pre-eclampsia and CVD was not modified by BMI.

We support the information provided by Hildén et al.<sup>1</sup>, and hypertension is a mediator of CVD rather than a component of the diagnostic bundle. It has been shown that pre-eclampsia and GDM can affect blood vessels, but it is not clear aetiology<sup>2</sup>. Previous studies indicated that women with GDM have an increased risk of developing preeclampsia, which in turn increases the risk of developing advanced CVD<sup>3,4</sup>. However, in these studies, there were many potential confounding factors due to the lack of adjustment for BMI. The current research just filled in this disadvantage. We thank Hildén et al.<sup>1</sup> for their comprehensive contribution.

We believe that the biggest advantage of this study is that it is a nationwide study, and the data collected prospectively has high credibility. The main disadvantage is that women with diabetes before pregnancy are excluded, which may have a great impact on the research results, leading to bias. This nested case-control study included 2639 cases and 13310 controls with complete data. So large number of study population will provide valuable guidance for clinicians to improve their understanding of pre-eclampsia and GDM related CVD, despite some limitations of this study. In addition, we are also looking forward to Hildén et al.<sup>1</sup> developing effective CVD prevention plans for high-risk women to improve their long-term health. Therefore, we believe the research by Muraca et al.<sup>1</sup> will greatly promote further researches on the pre-eclampsia and GDM related CVD.

## AUTHOR CONTRIBUTIONS

Heng Fan identified the significance and wrote the manuscript. Jian-hua Zhu edited the manuscript.

## DISCLOSURE OF INTERESTS

None declared. Completed disclosure of interest forms are available to view online as supporting information.

## DATA AVAILABILITY STATEMENT

Not applicable, and no new data generated.

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## References

1. Hildén K, Magnuson A, Montgomery S, Schwarcz E, Hanson U, Simmons D, Backman H. Previous pre-eclampsia, gestational diabetes mellitus and the risk of cardiovascular disease: A nested case-control study in Sweden. *BJOG*. 2023;130(10):1209-1216. <https://doi.org/10.1111/1471-0528.17454>.
2. Pace R, Brazeau AS, Meltzer S, Rahme E, Dasgupta K. Conjoint Associations of Gestational Diabetes and Hypertension With Diabetes, Hypertension, and Cardiovascular Disease in Parents: A Retrospective Cohort Study. *Am J Epidemiol*. 2017;186(10):1115-1124. <https://doi.org/10.1093/aje/kwx263>.
3. Tooher J, Thornton C, Makris A, Ogle R, Korda A, Hennessy A. All hypertensive disorders of pregnancy increase the risk of future cardiovascular disease. *Hypertension*. 2017;70(4):798-803. <https://doi.org/10.1161/HYPERTENSIONAHA.117.09246>.
4. Yogev, Chen, Hod, Coustan, Oats, McIntyre, Metzger, Lowe, Dyer, Dooley, Trimble, McCance, Had-den, Persson, Rogers; Hyperglycemia and Adverse Pregnancy Outcome (HAPO) Study Cooperative Research Group. Hyperglycemia and adverse pregnancy outcome (HAPO) study: pre-eclampsia. *Am J Obstet Gynecol* 2010;202(3):255.e1-7. <https://doi.org/10.1016/j.ajog.2010.01.024>.