

Women with a pregnancy history of spontaneous preterm delivery at higher risk of CVD

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A history of spontaneous preterm delivery appears to double a woman's risk of heart disease, stroke and other cardiovascular diseases, according to results of a study published today in the *European Journal of Preventive Cardiology*. The strength of the association was described by the investigators as "robust", and, as an independent risk factor for CVD, "almost equally strong" as raised blood pressure, elevated lipid levels, overweight, smoking and diabetes mellitus (with similar hazard ratios between 2.0 and 2.5).

The findings emerged from a meta-analysis of ten "high quality" cohort studies of populations from five European countries (Denmark, Finland, Norway, Scotland, Sweden). The sample sizes of the individual studies ranged from 3706 to 923,686, with follow-up from 12 to 35 years. Each of the ten studies had a cohort (observational) design assessing the association between spontaneous preterm delivery and fatal or non-fatal [ischaemic heart disease](#), stroke, or overall CVD (confirmed through linkage to national registries).

Analysis of the pooled data showed that spontaneous preterm delivery was associated with statistically significant increased risks in all parameters measured:

- the risk of fatal and non-fatal ischaemic heart disease increased by 38% (hazard ratio 1.38)

- the risk of fatal and non-fatal stroke increased by 71% (HR 1.71)
- and the risk of overall fatal and non-fatal cardiovascular disease more than doubled (HR 2.01).

Despite heterogeneity among the individual study results, the investigators of this analysis said the increased risks for women with a history of spontaneous preterm delivery were "observed consistently" when compared with those in women with term delivery, and they described the positive association as "robust".

Preterm delivery, defined as delivery before 37 weeks, has been found to occur in 12-13% of pregnancies in the USA, and 5-11% in Europe. Around one-third are medically indicated, often because of preeclampsia and foetal growth restrictions. The precise explanation for the remaining spontaneous preterm deliveries, say the investigators, "remains unknown in many cases", but may be "the result of infection, uterine overdistension or uterine anomalies".

However, the study's first investigator, Dr Karst Heida from the Department of Obstetrics at the University Medical Center, Utrecht, the Netherlands, explains that classic CVD risk factors, such as hypertension, high cholesterol, type 2 diabetes, and thrombosis, are often present in women after a spontaneous preterm delivery, and are likely to play a role in its causation. It may well be, therefore, that the very mechanisms behind the rise in other risk factors for CVD may also explain the association with spontaneous preterm delivery. This meta-analysis provides a quantitative estimate of the risk, if not an explanation for it.

Commenting on the public health implications of the results, Dr Heida said there was as yet insufficient evidence to include spontaneous preterm delivery in the accepted cardiovascular risk charts or in the standard prevention guidelines. However, he did agree that a history of

spontaneous preterm delivery may identify women who are at an [increased risk](#) of CVD and that such women "should be encouraged to optimise modifiable risk factors to reduce their risk of future CVD".

As yet, however, studies have not been able to evaluate the specific effect of preterm delivery over and above the effects of well established risk factors. He thus suggested that spontaneous preterm delivery may act like a "stress-test", revealing latent chronic disease risk. "The pathways leading to the increased risk of developing CVD are not clear and there may be overlap with the different pregnancy complications," he said, noting [blood pressure](#), lipid levels and weight. Smoking, for example, is associated with both an increased risk for preterm delivery and an increased risk of CVD. Yet only one of the ten studies in this analysis controlled for smoking before pregnancy.

Nevertheless, the statistical association found in these results are supported by biological plausibility inasmuch as inflammatory factors are observed in both preterm delivery and the development of CVD. In addition, said Dr Heida, the common cardiovascular [risk factors](#) of hypertension and diabetes are more prevalent in women with a history of [preterm delivery](#).

More information: Heida KY, Velthuis BK, Oudijk MA, et al. Cardiovascular disease risk in women with a history of spontaneous preterm delivery: A systematic review and meta-analysis. *Eur J Prevent Cardiol* 2015: [DOI: 10.1177/2047487314566758](https://doi.org/10.1177/2047487314566758)

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