

Estimation of 10-year cardiovascular disease risk following gestational diabetes mellitus in Indian women

Chockalingam Shivashri^{1,2}, Mohan Deepa², Yonas Ghebremichael-Weldeslassie^{1,3}, Wesley Hannah², Hemavathy Saite², Mohaneswari Duraivel², Ranjit Mohan Anjana², Ram Uma⁴, Viswanathan Mohan², Ponnusamy Saravanan^{1,5}

¹Populations, Evidence, and Technologies, Division of Health Sciences, Warwick Medical School, University of Warwick, Coventry CV4 7AL, United Kingdom. ²Madras Diabetes Research Foundation (ICMR Center for Advanced Research on Diabetes) and Dr. Mohan's Diabetes Specialities Centre, No 4, Conran Smith Road, Gopalapuram, Chennai, 600 086, India. ³School of Mathematics and Statistics, The Open University, Milton Keynes, United Kingdom. ⁴Seethapathy Clinic & Hospital, Chennai, India. ⁵ Department of Diabetes, Endocrinology, and Metabolism, George Eliot Hospital, Nuneaton, United Kingdom.



OBJECTIVE

Women with history of gestational diabetes mellitus (GDM) have twofold higher risk of developing cardiovascular disease (CVD) than normoglycaemic women. There is lack of data from south Asia, despite the high prevalence of GDM and onset of CVD at a younger age. The primary objective of our study was to assess CVD risk in Indian women 3-5 years post-delivery.

DESIGN

Prospective, longitudinal observational study.

METHODS

STratification of Risk of Diabetes in Early pregnancy (STRiDE) study was a longitudinal study of 2703 women recruited across seven centres from south India. Of this, 2400 women who had completed delivery entered the STRiDE follow-up study (STRiDE-FUS). The follow-up study was designed to assess the incidence of type 2 diabetes (T2D) and CVD risk in Indian women at 3-5 years post-delivery. Women underwent an oral glucose tolerance test and lipid profile along with measurement of anthropometric parameters and blood pressure. CVD risk scores were calculated as per the WHO calculator (WHO/ISH R-package). To date, 635 participants completed their follow-up with biochemical analysis (GDM-195, normoglycaemic-440). The diagnosis of GDM was by IADPSG criteria. The diagnosis of dysglycaemia (T2D and prediabetes) was by American Diabetes Association criteria.

METHODS

Logistic regression was used to evaluate the association of CVD risk in women with history of GDM (adjusted odds ratio (aOR) and 95% confidence intervals (95%CI)).

RESULTS

10.3% women with GDM had a 10-year CVD risk score of >20% (high risk of CVD) compared to 2.5% of normoglycaemic women ($p<0.0001$) at 4.2 $\pm$ 0.7 years post-delivery. Women with history of GDM had higher aOR for 10-year CVD risk of >20% compared to without GDM (aOR:4.0; 95%CI: 1.85-8.65; $p<0.0001$), adjusted for age, family history (FH) of diabetes, FH of CVD, BMI, and waist circumference.

Maternal characteristics	Mean $\pm$ SD
Age (years)	32.5 $\pm$ 4.2
Body Mass Index (kg/m ²)	27.3 $\pm$ 5.3
Systolic blood pressure (mmHg)	106 $\pm$ 12
Dysglycaemia (%)	35%

CONCLUSION

More than 10% of young women in India have a high 10-year estimated risk for CVD following a GDM pregnancy. This is higher than reported in western populations. Whether this translates into hard CVD outcomes requires longitudinal studies. Our findings emphasize the need for CVD risk assessment after GDM and design interventions to reduce CVD burden in young women in India.