

# Role of Metabolic Risk Factors, Family History, and Genetic Polymorphisms (PPAR $\gamma$ and TCF7L2) on Type 2 Diabetes Mellitus Risk in an Asian Indian Population

Plaban Chaudhuri<sup>a</sup> Mithun Das<sup>b</sup> Indrani Lodh<sup>c</sup> Riddhi Goswami<sup>a</sup>

<sup>a</sup>Department of Biotechnology, Heritage Institute of Technology, Kolkata, India; <sup>b</sup>Department of Anthropology & Tribal Studies, Sidho-Kanho-Birsha University, Purulia, India; <sup>c</sup>Urvaraa IVF Clinic, Kolkata, India

## Keywords

Asian Indians · Type 2 diabetes · Family history of diabetes · Gene polymorphisms · PPAR $\gamma$  · TCF7L2 · Birth outcomes

## Abstract

**Introduction:** Women with family history of diabetes (FHD) are at significantly increased risk of developing gestational diabetes mellitus which may eventually lead to type 2 diabetes mellitus (T2DM) in later life. **Objective:** This study investigates the role of FHD on metabolic markers and gene polymorphisms and hence on T2DM susceptibility in nondiabetic pregnant women and the subsequent risks in their newborns. **Materials and Methods:** The present study was conducted on 200 healthy (nondiabetic and normotensive) adult Asian Indian women, including 100 with and 100 without FHD, living in and around Kolkata, India. During the gestational period, they were studied twice and followed up till delivery. During delivery, both mothers' venous blood and cord blood were collected to estimate serum CRP, glucose, and lipid profiles of the respective mothers and their newborns. Genotyping of PPAR $\gamma$  and TCF7L2 polymorphisms was done from these blood samples. **Results:** A comparison of the metabolic variables among the subjects with and without FHD revealed significant differences among them. We also found close relationship between mothers and their

newborn babies in terms of both PPAR $\gamma$  (rs1801282) C/G and TCF7L2 (rs7903146) C/T polymorphisms. More specifically, genotyping results for mothers with FHD and their newborn babies showed high concordance in inheritance of alleles: (i) for PPAR $\gamma$  via the risk allele G (74.0%) which is carried over to the newborn babies (64.5%) and (ii) for TCF7L2 via the risk allele T (73.0%) which is carried over to the newborn babies (68.5%). **Conclusion:** This study leads to the conclusion that Asian Indian women population based in Kolkata, India, are ethnically and genetically predisposed to the risk factors of diabetes through FHD, which is reflected in their gestational phase, and it has a significant implication on their birth outcomes.

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## Introduction

Metabolic syndrome (MetS) is the culmination of a number of risk factors which gives rise to a variety of potentially harmful diseases such as cardiovascular disease and more importantly development of type 2 diabetes mellitus (T2DM). There are a number of other factors which may give rise to MetS which include insulin resistance (IR), atherogenic dyslipidemia, obesity, genetic inheritance, and high blood pressure. MetS can cause a