Study shows that women who smoke during pregnancy increase the risk of both obesity and gestational diabetes in their da

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Women who smoke during pregnancy increase the risk of both obesity and gestational diabetes, in their daughters, concludes research published in *Diabetologia*, the journal of the European Association for the Study of Diabetes. The study is by Dr Kristina Mattsson, Lund University, Sweden, and colleagues including Dr Matthew Longnecker from the National Institute on Environmental Health Sciences at the U.S.National Institutes of Health, North Carolina, USA.

While the relation of prenatal tobacco exposure to negative outcomes in childhood has been much studied, reports on possible adverse effects that persist until adulthood are more scarce and results are inconsistent. In the study using data from the Swedish Medical Birth Register, the authors investigated the relationship between a woman smoking in pregnancy and the chances of her daughter then developing gestational diabetes and obesity.

Data were retrieved from the Medical Birth Register of Sweden for women who were born in 1982 (when smoking data were first registered) or later and who had given birth to at least one child; 80,189 pregnancies were included. The data on maternal smoking behaviour in the register are categorised into three categories: non-smokers, moderate smokers (1-9 cigarettes/day) and heavy smokers (>9 cigarettes/day). Among the daughters studied, 7,300 subsequently became obese and 291 developed gestational diabetes when they themselves were pregnant.

The risk (odds ratio) of gestational diabetes was increased by 62% among women (daughters) who were moderately exposed to smoking in the womb and 52% among those heavily exposed.The women moderately exposed were 36% more likely to be obese and those heavily exposed 58% more likely to be obese. The associations remained after adjustment for age, parity, BMI, mode of delivery, gestational age and birthweight.

The authors suggest possible mechanisms behind the associations could be alterations in the regulation of appetite and satiety, which has been found in animal studies. Other reported effects of prenatal nicotine exposure include a higher rate of death of the insulin-producing beta cells in the pancreas, and increased gene expression of transcription factors triggering formation of fat cells (adipocyte differentiation), which could be involved in the development of diabetes and obesity, respectively. In addition, the authors add that recent data show epigenetic changes in the offspring of smoking mothers (meaning the smoking actually causes changes in the gene expression in the unborn child that could predispose them to later obesity or diabetes). They caution though, that unmeasured differences in diet or other factors between families with and without smokers could possibly account for the associations observed.

The authors say: "In conclusion, these data show that women exposed to smoking during fetal life are at higher risk of developing gestational diabetes. Although short-term detrimental effects of smoking on the individual and her offspring are well known, such associations might extend into adulthood, making the incentive stronger for undertaking preventable measures, particularly as numbers in some countries point to an increase in daily smoking among young women."

Provided by Diabetologia