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The effect of diabetes in pregnancy

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Abstract

Diabetes in pregnancy is unique because of the diversity of problems that can affect the embryo/fetus . Considerable effort has been devoted to understanding the basic developmental biology from observing young embryos. Maternal glucose control has been identified as an important event. The preponderance of evidence indicates that rigid glucose control will minimize the incidence of anomalies incurred before 9 weeks of pregnancy. Later events are related to fetal hyperinsulinemia. These include fetal macrosomia, respiratory distress syndrome, neonatal hypoglycemia, neonatal hypocalcemia, and neonatal obesity . Control of maternal metabolism can have a significant impact on each of the above. Finally, the long-term effects of maternal diabetes are as diverse as the pathogenetic events during pregnancy. Surprisingly, there is a significant transmission rate of 2% of type I diabetes if the mother has insulin-dependent diabetic mother, whereas the rate is 6% for these problems in three studies. .

Introduction

For pregnant women with diabetes mellitus some particular challenges for both mother and child. If the woman has diabetes as an intercurrent disease in pregnancy, it can cause early labor, birth defects, and very large babies.

Planning in advance is emphasized if one wants to have a baby and has type 1 diabetes mellitus or type 2 diabetes mellitus. Pregnancy management for diabetics needs stringent blood glucose control even in advance of having pregnancy.

During a normal pregnancy, many physiological changes occur such as increased hormonal secretions that regulate blood glucose levels, such as a glucose-'drain' to the fetus, slowed emptying of the stomach, increased excretion of glucose by the kidneys and resistance of cells to insulin.

The risks of maternal diabetes to the developing fetus include miscarriage, growth restriction, growth acceleration, fetal obesity (macrosomia), mild neurological deficits, polyhydramnios and birth defects. A hyperglycemic maternal environment has also been associated with neonates that are at greater risk for development of negative health outcomes such as future obesity, insulin resistance, type 2 diabetes mellitus, and metabolic syndrome

Mild neurological and cognitive deficits in offspring — including increased symptoms of ADHD, impaired fine and gross motor skills, and impaired explicit memory performance — have been linked to pregestational type 1 diabetes and gestational diabetes. Prenatal iron deficiency has been suggested as a possible mechanism for these problem[.1]

Discussion

They studied the relation in nomia Indians in 2012 between obesity in children and diabetes during pregnancy in their mothers. Sixty-eight children of 49 women who had had diabetes during pregnancy had a higher prevalence of obesity than 541 an 1326 children of 134 women who subsequently had diabetes (prediabetics) or th children of 446 women who remained nondiabetic. At 15 to 19 years of age, 58 per cent of the offspring of diabetics weighed 140 per cent or more of their desirable weight, as compared with 17 per cent of the offspring of nondiabetics and 25 per cent of those of prediabetics ($P<0.001$). Obesity in the offspring was directly related to maternal diabetes, since the association was not substantially confounded by maternal obesity. The findings strongly suggest that the prenatal environment of the offspring of diabetic women results in the development of obesity in childhood and earlyadulthood .[2]

In 20011 by the American Diabetes Association in combllеg university,the purpose of this study was to investigate whether nondiabetic gestationai hyperglycemia during fetal life could have additional effects on glucose homeostasis and insulin secretion in the adult rate. Hyperglycemia without the main other metabolic disorders and vascular injuries associated with diabetes was produced in unrestrained pregnant rats by continuous glucose infusion during the last week of pregnancy. Control rats were infused with distilled water. Compared with controls, the newborns from hyperglycemic rats were hyperglycemic and hyperinsulinemic. When studied longitudinally up to 3 mo, they showed slightly but significantly increased basal plasma glucose levels and normal basal insulin concentrations compared with controls. Glucose tolerance and insulin secretion in response to a glucose load (0.5 mg/kg, i.v.) were altered: Plasma glucose values were more increased at 5 min and remained higher 90 min after glucose injection; incremental plasma insulin values and the insulinogenic indexes ($\Delta IRI/\Delta G$) were always lower in rats from hyperglycemic mothers than in controls. These alterations were more and more marked with advancing age (1–3 mo). These data show that gestationai hyperglycemia may lead to persistent impairment of glucose homeostasis and insulin secretion in the adult rate [3]

The long-term effects on offspring of abnormal glucose tolerance detected during pregnancy were examined in 552 Pima Indian in 2008 by offspring 5–24 yr of age. Fasting hyperinsulinemia, presumably reflecting increased insulin resistance, occurred at an earlier age in the offspring of women who had abnormal glucose tolerance during pregnancy, and these offspring were more obese and had higher rates of abnormal glucose tolerance. When confounding factors were controlled, a 1 mM higher 2-h postload glucose concentration during pregnancy resulted in a significantly higher prevalence of diabetes in the offspring (odds ratio = 1.62). Maternal 2-h glucose concentration during pregnancy was also a significant predictor of glucose concentration during pregnancy in the offspring ($P = 0.011$). Thus, the metabolic abnormalities associated with the diabetic pregnancy result in long-term effects on the offspring, including insulin resistance, obesity, and diabetes, which in turn may contribute to transmission of risk for developing the same problems in the next generation .[4]

Conclusion

1- Researches include the diabetes in pregnancy is unique because of the diversity of problems that can affect the embryo/fetus beginning with conception .

2- Maternal glucose control has been identified as an important event .

3- The most studies indicates that rigid glucose control will minimize the incidence of anomalies incurred before 9 weeks of pregnancy

4-. The diabetes in early pregnancy study showed that good maternal control was associated with normal neuro developmental outcome.

References

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