Diabetes and Pregnancy

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A new structure arises de novo during pregnancy, develops and matures till it is expelled at the completion of the gestational period. The metabolic adaptations that occur during pregnancy are to accommodate a rapidly growing tissue transplant, the conceptus. For its own normal growth and development, the conceptus brings about alterations in maternal fuel metabolism and hormones. The placenta facilitates embryogenesis, growth, maturation and survival of the fetus. It has the capacity to synthesize steroid and peptide hormones and to modulate and transport maternal fuel to the fetus.

FUEL METABOLISM IN NORMAL PREGNANCY

The fuel metabolism during normal (non-diabetic) pregnancy is characterized by facilitated insulin action during the first half of pregnancy and diabetogenic stress during the second half of pregnancy.

In the early weeks of gestation, serum levels of estrogen and progesterone rise and induce β-cell hyperplasia resulting in increased secretion of insulin (hyperinsulinemia) and heightened sensitivity to insulin. Insulin, being an anabolic and anticatabolic hormone, favors tissue glycogen storage, prevents production of glucose from the liver and increases peripheral glucose utilization. The net effect of these anabolic changes is a decrease in fasting blood glucose by 10% compared to non-pregnancy fasting value.

During the later half of pregnancy, the facilitated insulin action continues and at the same time, there is increased secretion of placental chorionic somato-mammotrophin (human placental lactogen, hPL), prolactin and cortisol. These surges in counter