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Diabetes in pregnancy



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Diabetes in pregnancy is still considered a high-risk condition for both mother and baby. Even in the best centres, malformation and mortality rates are reportedly twofold to fivefold higher than in the background population, and pregnancy planning rates remain obstinately poor. Increasing global rates of type 2 diabetes are now extending into pregnancy, with similarly poor outcomes to type 1 diabetes, and excess maternal weight is adding to the complexity of management. Over the last 5–10 years, several randomised trials have offered new insight into the role of oral hypoglycaemic drugs and insulin analogues in pregnancy, while continuous subcutaneous insulin infusion (CSII) pumps and continuous glucose monitors (CGMs) are under scrutiny. The relevance of minor degrees of hyperglycaemia to adverse pregnancy outcome was clearly demonstrated by the Hyperglycaemia and Adverse Pregnancy Outcome (HAPO) study, but translation of these data into clinical practice has proved challenging because of the continuum of risk. Long-term metabolic and cardiovascular implications of hyperglycaemia during pregnancy for mother and child are now generally recognised with major implications for public health.

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Epidemiology

Globally, 21.4 million (16.9%) of 127.1 million live births to women aged 20–49 years are affected by hyperglycaemia in pregnancy [1]. Approximately 16% of the 21.4 million may be caused by diabetes in pregnancy (including known and previously undiagnosed diabetes). These statistics reflect the growing prevalence of the type 2 diabetes epidemic on pregnancy, and they vary significantly with ethnicity and location. 91.6% of cases are reported in low- and middle-income countries where access to maternal care is often limited [1]. A UK survey in 2003 estimated the frequency of type 1 diabetes as one in 364 (0.27%) and type 2 as one in 955 (0.10%) births [2]. The increase in hyperglycaemia in pregnancy is compounded by overweight/obesity, which now affects about half of women who give birth [3].

Adverse perinatal outcomes

A review of 12 population-based studies published within the last 10 years compared 14,099 women with type 1 diabetes with 4,035,373 women from the background population [4] reported a twofold to fivefold increased risk of adverse pregnancy outcomes as follows:

- Congenital malformations, 5.0% versus 2.1% (relative risk (RR): 2.4)
- Perinatal mortality, 2.7% versus 0.72% (RR: 3.7)
- Preterm delivery, 25.2% versus 6.0% (RR: 4.2)
- Large for gestational age (LGA) infants, 54.2% versus 10.0% (RR: 4.5)

In the UK Confidential Enquiry into Maternal and Child Health (CEMACH), 4% of foetuses had at least one major congenital anomaly (twice that of the general population). The most common anomalies were congenital heart disease (1.7%; three times that of the general population) and musculoskeletal (0.7%) [3]. At least one in two infants of mothers with type 1 diabetes has complications related to glucose control [3].

Type of diabetes and outcomes

The outcomes of women with type 1 and type 2 diabetes are equally poor [5]. A recent meta-analysis of 33 studies involving 7966 type 1 and 3781 type 2 pregnancies showed that women with type 2 diabetes had a significantly higher risk of perinatal mortality but no difference in rates of malformation [6].

Risks and risk factors

These are well established for both mother and baby, and are modified to some extent by the type and duration of diabetes, glycaemic control and diabetes-related vascular complications [5]. Fifty per cent of babies may need admission to neonatal care (10% intensive care) [7], and the following are the risk factors:

- General risk factors: age, parity, weight, hypertension, smoking and drug abuse
- Obstetric risk factors: previous miscarriage, multiple pregnancy, nutritional deficiency, late booking and poor obstetric history
- Maternal risk: miscarriage, accelerated retinopathy and nephropathy, hypoglycaemia and hypoglycaemic unawareness, diabetic ketoacidosis (DKA), pre-eclampsia, hydramnios, operative delivery and infection
- Foetal risk: stillbirth, perinatal mortality, congenital anomalies, small/large for gestational age (SGA/LGA), preterm delivery, operative delivery, shoulder dystocia and birth injury, neonatal hypoglycaemia, polycythaemia, hypocalcaemia and respiratory distress syndrome

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