ATLANTIC DIP: Closing the Loop

A change in clinical practice can improve outcomes for women with pregestational diabetes

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OBJECTIVE — Prospective evaluation of pregnancy outcomes in women with pregestational diabetes over 6 years.

RESEARCH DESIGN AND METHODS — The ATLANTIC Diabetes in Pregnancy group provides care for women with diabetes throughout pregnancy. In 2007, the group identified that women were poorly prepared for pregnancy and outcomes were suboptimal. A change in practice occurred, offering women specialist-led, hub-and-spoke evidence-based care. We now compare outcomes from 2005 to 2007 with those from 2008 to 2010.

RESULTS — There was an increase in the numbers attending preconception care (28–52%, \( P = 0.01 \)). Glycemic control before and throughout pregnancy improved. There was an overall increase in live births (74–92%, \( P < 0.001 \)) and decrease in perinatal mortality rate (6.2–0.65%, \( P < 0.001 \)). There was a decrease in large-for-gestational-age babies in mothers with type 1 diabetes mellitus (30–26%, \( P = 0.02 \)). Elective caesarean section rates increased, while emergency section rates decreased.

CONCLUSIONS — Changing the process of clinical care delivery can improve outcomes in women with pregestational diabetes.

Pregnancy can pose significant risk to women with type 1 (T1DM) or type 2 (T2DM) diabetes mellitus. Optimal care has been shown to decrease these risks. The ATLANTIC Diabetes in Pregnancy (ATLANTIC DIP) group established in 2005 represents five antenatal centers in a wide geographical location along the Irish Atlantic seaboard, covering a population of 500,000. The group provides coordinated care for women with diabetes before, during, and after pregnancy. This report outlines pregnancy outcomes in women with pregestational diabetes, following changes to the process of clinical care delivery.

RESEARCH DESIGN AND METHODS — This is a prospective follow-up study designed to assess outcome after postaudit change in the process of clinical care delivery. The change resulted in the provision of dedicated combined antenatal/diabetes clinics and prepregnancy care (PPC) clinics delivered by specialist diabetes and obstetric staff. Clinical care delivery was supported by a diabetes electronic management system (DIAMOND), locally developed clinical care guidelines based on National Institute for Health and Clinical Excellence (NICE) guidelines (2), and professional and patient education materials. Pregnancy outcomes were compared before (2005–2007) and after (2008–2010) implementation of these changes. PPC involved education, contraceptive advice, provision of folic acid (5 mg) for 12 weeks, discussion of glycemic targets, initiation and/or intensification of insulin, prevention and treatment of hypoglycemia, discontinuation of teratogenic drugs, and management of blood pressure and diabetes-related complications.

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There was no change in numbers born small for gestational age. Caesarean section rates increased overall, with an increase in elective rates from and a nonsignificant reduction in emergency section rate (Table 1). In addition, there was a nonsignificant reduction in the number of babies admitted to neonatal intensive care.

Mean booking BMI was unchanged (mean 26 kg/m²) in women with T1DM. In comparison, mean BMI of women with T2DM increased from 30 to 34 kg/m² between the two time intervals (P = 0.034). More women with T2DM were obese (BMI >30 kg/m²) in time period 2 compared with time period 1 (P = 0.04).

CONCLUSIONS—Pregestational diabetes occurs in approximately 1 in 250 pregnancies, and prevalence is increasing (3) worldwide. Pregnancies in women with pregestational diabetes are associated with increased maternal and neonatal morbidity and mortality, as has been demonstrated by studies including the Confidential Enquiry into Maternal and Child Health (CEMACH) diabetes report (3) and by this study group (1).

Maternal complications include higher rates of caesarean delivery (3), worsening of preexisting retinopathy (5) and nephropathy (6), and higher rates of hypertension and preeclampsia (3). Fetal/neonatal complications include higher perinatal mortality rates (2), more LGA babies associated with shoulder dystocia and caesarean delivery (7), and more congenital anomalies twice that of the background population (1). These results are similar to those reported by previous population-based studies (3,14). In addition, women were poorly prepared for pregnancy, with only 28% of women attending PPC, 43% taking folic acid prior to pregnancy, and one-half entering pregnancy with an HbA1C <7% (1). These results are similar to those reported by previous population-based studies (3,14). There have been few similar studies, but previous intensive pregnancy care programs have been shown to be similarly effective (15).

Following these results, ATLANTIC DIP concentrated on changing the process of clinical care delivery and developed combined antenatal/diabetes clinics and dedicated PPC clinics, electronic data collection, clinical care guidelines, and professional and patient education materials, aiming to “close the audit loop.” We have now subsequently compared outcomes and found that more women are attending PPC, with better glycemic control resulting in a decrease in miscarriage and stillbirth rates and an increase in take-home-baby rate. There have been few similar studies, but intensive pregnancy care programs have been shown to be similarly effective (15). T2DM in pregnancy is becoming more common, and these women are becoming more obese and delivering more macromosaic babies. Further work is required for optimization of this cohort of women.

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