

Aims

The Brecon register is a community based register of type 1 diabetes (T1D) diagnosed prior to age 15 in Wales since 1995 (98% ascertainment). This study aims to utilize the Brecon register to compare pregnancy outcomes in young women (up to age 35) with childhood onset T1D and the background population. In addition, we aim to describe the relationship between maternal age, T1D duration and pregnancy outcomes, which is not currently well understood.

Methods

The Brecon register was linked to multiple national datasets in the Secure Anonymised Information Linkage (SAIL) databank, to conduct an electronic record-linked cohort study of pregnancies resulting in legal births in women under 35 between 1995-2013 in Wales. We compared outcomes for pregnancies in women with childhood onset T1D (Brecon mothers) and pregnancies occurring in women without childhood onset T1D (background population).

Multiple imputation was used to account for missing data under the missing at random assumption. Statistical analysis involved logistic regression, with estimates of effects reported as odds ratios with 95% confidence intervals. Subgroup Analyses: We compared outcomes between teenage mothers (≤ 19 years) and older mothers (≥ 20 years) in the two groups (Brecon/Background) by including an interaction term (group x maternal age) in the regression models. We also compared outcomes between Brecon mothers with T1D of ≤ 10 years duration, and Brecon mothers with T1D of >10 years duration.

The study outcomes were:

- * maternal pre-eclampsia
- * low birth weight (≤ 2.5 kg)
- * congenital malformations
- * admission to hospital during the first year of life
- * preterm birth ($<37^{\text{th}}$ weeks)
- * macrosomia (birth weight ≥ 4 kg)
- * stillbirths

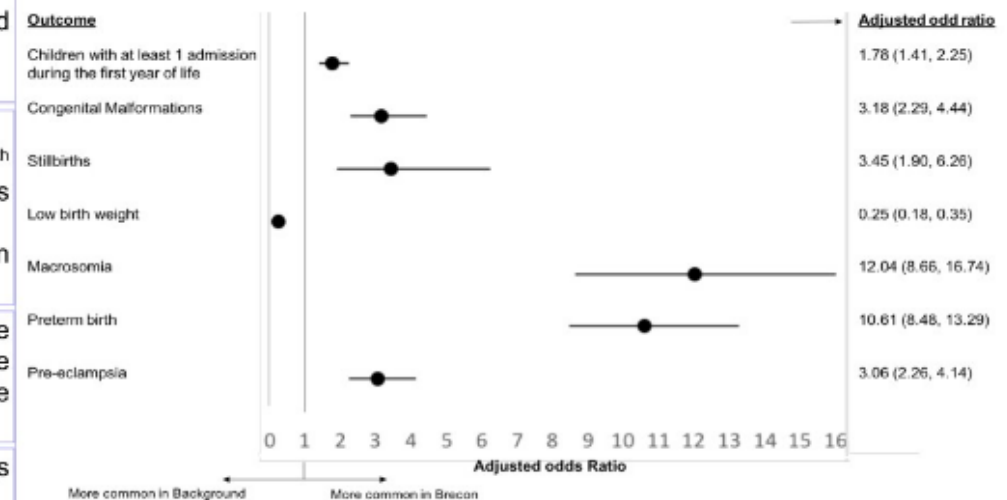
We adjusted for the following potential confounding factors:

- * Maternal age
- * Parity
- * Delivery via Caesarean Section
- * Maternal smoking
- * Socioeconomic status
- * Gender
- * Gestation at delivery
- * Breastfeeding

Results

- 197,796 births were eligible for inclusion, of which 330 were to Brecon mothers.
- Baseline characteristics were comparable, except:
 - mode of delivery (66.6% Caesarean section in Brecon mothers vs 18.5% in the background population)
 - mean gestational age at delivery (35.72 weeks vs 39.72 weeks.)
- All adverse outcomes except low birth weight were more common in Brecon mothers (figure 1).
- Time to first hospital admission was lower for the children of Brecon mothers (median 4 days, 25th to 75th centile = 2 to 19.75 vs median 50 days, 25th to 75th centile = 8 to 165 days) (adjusted odds ratio 1.62, 95% confidence intervals 1.41-1.86).
- After discounting admissions in the first 28 days of life, there was no significant difference in admissions to hospital during the first year between groups.
- Babies of teenage Brecon mothers were at highest risk of admission during the first year of life ($p < 0.001$). This remained significant after discounting admissions in the first 28 days of life ($p = 0.01$.) Other adverse outcomes were not significantly different between groups when the interaction (group x maternal age) was tested as part of our subgroup analyses.
- No significant differences were observed in adverse outcomes amongst babies born to mothers with T1D of ≤ 10 years duration, compared with mothers with T1D >10 years duration.

Figure 1: Forest plot showing the adjusted odds ratio for adverse outcomes for babies born to Brecon mothers compared with babies born to mothers in the background population.



Conclusions

Obstetric outcomes remain poor in mothers with childhood onset T1D compared with the background population, despite significant advances in obstetric and diabetes care. New treatments such as immunotherapy to preserve beta cell function may improve pregnancy outcomes in this cohort, and further studies are required to explore this.

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