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Early term, preterm and post-term gestation births increase the risk of special educational needs during schooling

QUESTION

Question: Does preterm delivery at any time increase the risk of later special educational needs (SENs)?

Population: 407 503 eligible school children younger than 19 years of age attending mainstream schools, special schools and school classes and units within mainstream schools in Scotland. Children who could not be linked to their obstetric data were excluded.

Setting: School children resident in 19 Local Authority areas in Scotland; recruited from 2005 school census data.

Prognostic factors: Obstetric complications and course; individual school census record was linked to mother's data from the Scottish Morbidity Record that collects information on all women discharged from Scottish maternity hospitals including maternal and infant characteristics, clinical management and obstetric complications.

Outcomes: Incidence of SEN collated from information in the school census.

METHODS

Design: Retrospective cohort study.

Follow-up period: Birth to 19 years old.

MAIN RESULTS

18 527 (5%) of sampled school children were born preterm (<37 weeks gestation), 58 611 (16.2%) were born by caesarean section and 10 404 (2.8%) had an Apgar score less than eight. The median birth weight was 3400 g. 17 784 children had

a record of SEN. Low birth weight (<2500 g) was associated with an increased risk of subsequent SEN (unadjusted OR 2.22, 95% CI 2.10 to 2.33, $p<0.001$). Extreme preterm delivery (24–27 weeks) was associated with increased risk of subsequent SEN (adjusted OR 6.92, 95% CI 5.58 to 8.58, $p=0.001$); the risk declined as births approached a gestational age of 40–41 weeks. Compared with infants born at 40 weeks, early term babies (born between 37 and 39 weeks of gestation) had an increased risk of SEN (adjusted OR 1.16, 95% CI 1.12 to 1.20, $p<0.001$). Infants born at 39 weeks of gestation were also at increased risk of SEN (adjusted OR of 1.09, 95% CI 1.04 to 1.14, $p<0.001$). The risk of developing subsequent SEN was also increased in children born at 42 weeks of gestation (42 weeks; adjusted OR 1.16, 95% CI 1.08 to 1.25, $p<0.001$), although the risk was not significantly increased in those born at 43 weeks (adjusted OR 1.35, 95% CI 0.87 to 2.09, $p=0.180$). There was no difference between the likelihood of subsequent SEN in children who had been born by elective versus spontaneous delivery.

CONCLUSIONS

Preterm, early term and post-term births were all associated with an increased risk of the infant having SENs during their schooling. The relationship with regard to the severity of special needs was not assessed.

NOTES

Some subgroup analyses (eg, those born at 43 weeks of gestation) may have been underpowered to detect significant differences between the groups. It is unclear whether the analyses adjusted for multiple comparisons.

ABSTRACTED FROM

MacKay DF, Smith GC, Dobbie R, *et al.* Gestational age at delivery and special educational need: retrospective cohort study of 407,503 schoolchildren. *PLoS Med* 2010;**7**:e1000289.

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The population-based study carried out by MacKay and colleagues in a very large (362 688 children) population-based sample replicates previous similar findings^{1 2} that the odds of special educational need (SEN) are highest for those born at 24–27-week gestation (univariate OR 9.14, 95% CI 7.53 to 11.18) and increased for those born at 28–32 weeks (OR 3.21, 95% CI 2.90 to 3.57) and 33–36 weeks (OR 1.67, 95% CI 1.57 to 1.78). The study is unique, however, in that it also looked at the risk for SEN for those children born at early term (37- to 39-week gestation). They also had a 9% (39 weeks gestation) to 43% (37 weeks) excess odds of SEN indicating a dose-effect across the whole gestation range. Although preterm children are at highest risk, they made up only a small proportion of those born (5.1%) and only 3.5% of SEN cases could be attributed to preterm delivery. By contrast, 39.6% were delivered between 37 and 39 weeks of gestation and 5.3% of SEN cases could be attributed to early term delivery. A caveat is that the study included only singletons although up to 25% of very preterm births are multiple births.³

The true attributable risk may have been slightly underestimated for preterm births.

The implications are that biologically 40–41-week gestation appears to be the optimal time for birth to prevent SEN. It is thus worrying that several trends in reproductive medicine may counteract educational efforts to improve school outcome, including increased assisted reproduction and multiple births, maternal age and obesity.³ Similarly, early term delivery has increased largely due to an increase of caesarean sections upon request. Considering latest SEN statistics,⁴ approximately 2000 cases per year of any SEN could be prevented in England alone by reversing increases in preterm birth of 2%, and an additional 1200 SEN cases could be prevented by reversing the 6.2% increase in near term births. Considering that intensive postdischarge developmental interventions have not been found to improve cognitive outcome into school age in preterm children,⁵ reversing trends in preterm birth rates and reducing elective early term delivery could have a major impact on educational outcome and costs.

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Competing interests None.

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