

FOCUS ON RESEARCH

THE CHANGING INFLUENCES OF FETAL GENDER AND MATERNAL SOCIAL DEPRIVATION ON 3 SINGLETON PREGNANCY OUTCOMES IN SCOTLAND 1981-2001

Researchers

Sandra Bonellie, Claire Williams, Ron Gray, James Chalmers, Ian Greer, Edmund Hey, Stephen Jarvis

Aim

To investigate the effect of social deprivation over time, on various measures of fetal growth and on the risk of stillbirth or death in the first month of life.

Project Outline/Methodology

The national maternity data for Scotland (SMR02 and the Stillbirth & Neonatal death data) for the years 1980 to 2003 was used. The following outcomes were examined:

- mean gestational age at birth;
- proportion of births <37 weeks gestation;
- mean z-score, birthweight adjusted for gestational age, gender & number of previous completed pregnancies (parity)
- optimal birth weight for neonatal mortality:

Statistical methods were used to disentangle the effects of a number of factors including: gender; number of previous pregnancies; maternal height; year of birth; Carstairs index of deprivation; maternal age; mode of delivery; and smoking.

Key Results

Deprivation is associated with shortened gestation, low birthweight and higher risk of fetal and neonatal loss. Furthermore, the deprivation gap has widened in recent years for birthweight and z-score and for the risk of pre-term birth. The change in deprivation effect over time for the z-score is more noticeable for taller women.

The study also confirms that male babies are larger and that they have shorter gestation, but it did not show any change in these parameters with time.

Maternal smoking explains a large part of the effect of deprivation on gestation, z-score and mortality risk. It seems likely that the increase over time in z-scores might be almost fully explained by reduction in smoking prevalence combined with increases in maternal height.

The optimum birthweight for babies (adjusted for gestation, gender and parity) is higher than the

average birthweight. This is particularly noticeable in premature babies and is consistent over most sub groups of the population.

Conclusions

This study has successfully used statistical modelling techniques on a large and unique dataset to answer a number of specific questions relating to fetal growth and risk. It has also provided new national standards for birthweight for gestational age.

In addition to answering the questions originally posed, it has given considerable insight into other important facets, particularly the influence of smoking and also maternal height.

What does this study add to the field?

We now have a better understanding of the influences on fetal growth, specific to a modern Scottish population. The magnitude of the detrimental effect of maternal smoking is particularly important because this is a preventable factor.

Implications for Practice or Policy

New national standards for birthweight will allow better assessment of risk in newborn babies and will guide their individual care. Further efforts need to be directed towards smoking prevention and cessation in the young female population.

It is important for studies of this type that the routine data is as complete as possible. It was noted that the number of records missing information on height has increased substantially over recent years.

Where to next?

There is further work to be done in disentangling the effects of the various factors, and in particular, in trying to provide guidance on optimal gestations for intervention dependent on information about fetal growth.

Further details from:

Dr Sandra Bonellie,
Napier University,
Merchiston Campus,
Edinburgh, EH10 5DT
Email: S.Bonellie@napier.ac.uk

