OPINION

Does the baby gain weight during labour?

Tim Chard

Department of Obstetrics and Gynaecology, St Bartholomew’s and The Royal London School of Medicine and Dentistry, St Bartholomew’s Hospital, West Smithfield, London EC1A 7BE, UK. E-mail: Tim_Chard@compuserve.com

The present study was based on 6940 live singleton births without obvious congenital abnormalities delivered at 24–32 weeks. The birthweight of children born by Caesarean section was lower than that of those born vaginally. This applied whether the baby survived or died during the neonatal period; whether or not there was maternal hypertensive disease; and whether the delivery was at 24–28 or 29–32 weeks. Birthweight for gestational age was greater in those born by emergency Caesarean than those born by elective Caesarean section. After consideration of a number of potential confounding factors, these findings accord with the hypothesis that the baby might gain weight during labour.

Key words: birthweight/Caesarean section/weight gain

Introduction

Several authors (Lucas et al., 1986; Yudkin et al., 1987) have noted that babies born by Caesarean section have a lower birthweight than those born vaginally. The clinical reasons for carrying out a Caesarean section may relate to birthweight e.g. pre-eclampsia. However, an alternative hypothesis is that the fetus gains weight as part of the labour process.

Subjects, methods, and results

The present study was based on 6940 live singleton births without obvious congenital abnormalities at 24–32 weeks delivered in 1986–1992 (data from the Scottish SMR2 database kindly provided by G.Penney, J.Chalmers, E.Shanks and S.Paterson). Individual birthweights were expressed as a multiple of the median (MoM) for the relevant week of gestation (Chard et al., 2000).

The birthweight of children born by Caesarean section was lower than that of those born vaginally (Table I). This applied whether the baby survived or died during the neonatal period; whether or not there was maternal hypertensive disease; whether the delivery was at 24–28 weeks or 29–32 weeks; to both male and female infants; and to both primiparous and multiparous. Birthweight for gestational age was greater in those born by emergency Caesarean section than in those born by elective Caesarean section (Table II).

Comments

The present study confirms the difference in birthweight between babies born by Caesarean section and those born vaginally (Lucas et al., 1986; Yudkin et al., 1987). It also shows that the difference cannot be attributed to the most obvious factors which might be associated with the decision to perform a Caesarean section. The birthweight difference applied to cases both with and without hypertensive disease, and also within the group identified as having maternal hypertensive disease. The same difference was observed amongst surviving and non-surviving babies.

In the absence of any obvious clinical association, there is nothing to contradict the possibility that the baby gains weight during a normal (or abnormal) labour. To evaluate this point, birthweights of babies born by elective and emergency Caesarean section were compared; the latter, by definition, had gone through some period of labour. Both for the whole population, and those in whom the babies survived the neonatal period, birthweight was greater in those born after a period of labour (Table II). The same trend could be discerned in the smaller groups of babies who died in the neonatal period, or whose mothers had hypertensive disease, though these differences were not significant. A further corollary to the hypothesis that the baby gains weight during labour is that weight would show a relationship to the length of labour: it was not possible to evaluate this in the present study, but clearly it might be susceptible to examination in other databases.

An increase in the weight of a fetus during the course of labour has not hitherto been either directly observed or even suggested, but equally there is no evidence which excludes this possibility. If such an increase does, indeed, occur, the question arises as to the mechanism. Most of the factors known to affect birthweight would not explain the current findings. Changes in endocrine status, growth factor release or nutrition are all most unlikely to be significant in the very short time scale involved. Probably the most likely factor is a shift in

© European Society of Human Reproduction and Embryology
fluid balance within the fetus: it is not difficult to envisage that this could occur simply as a result of the mechanical stresses imposed upon the fetus during the course of labour.

Whatever the cause, the major difference in birthweight according to mode of delivery has important practical implications. The baby born vaginally weighs some 10–15% more than its counterpart born by Caesarean section. This difference is at least as large as that which has been noted for well-recognized factors such as smoking or maternal hypertensive disease. It suggests that mode of delivery should be explicitly included in any system which attempts to relate outcome with birthweight. For example, a factor might be presumed to be associated with reduced birthweight, when in fact this was secondary to an association with mode of delivery.

References