Commentary: Unravelling the mystery of variation in birthweight

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Birthweight is closely associated with morbidity and mortality of the newborn. Extensive research during the past 15 years has provided increasing evidence that birthweight is also important for health later in life. Such information underscores the importance of birthweight monitoring. In this issue of the International Journal of Epidemiology Silva et al. publish a paper about birthweight fluctuations in Ribeirão Preto, São Paulo, Brazil. During a 15-year period from 1978/79 to 1994 there was considerable economic development and a general improvement in education and income level accompanied by a population growth of 45% in the region. Even though the social indicators improved, a birthweight reduction of 122 g was observed. The downward trend may partly be explained by an increasing number of preterm births and factors related to marital status.

A lesson from history

Birthweight is a sensitive indicator of short-term changes in living conditions. Historical birthweight data has provided a new window to the living conditions of past populations. The current extensive socio-economic transformations in many parts of the developing world parallel the situation in Western Europe and North America during last part of the 1800s. Even though this period was characterized by general economic improvement with an overall increase in real income for the majority of the working classes, a corresponding downward trend in birthweight of approximately 200 g was observed in Vienna and Montreal. Such periods of rapid socio-economic change may create a complex picture characterized by social injustice and instability with a more difficult situation for many childbearing women. In Ribeirão Preto the prevalence of single mothers doubled (from 6.8% to 12.2%) between the two periods studied by Silva et al., and, even though the average income increased, the minimum wage was lower in 1994 than in 1978/79.

Socio-economic factors and birthweight

Preterm birth is more common in socially disadvantaged groups. The causal pathways and mechanisms that may explain social disparities in preterm births are still relatively unexplored, but several potential mediators have been identified. Women of low socio-economic position are more prone to heavy cigarette smoking and substance use, bacterial vaginosis, strenuous work and stressful events in life, low level of social support, and reduced intake of micronutrients. On the other hand, the magnitude of the associations between socio-economic factors and birthweight may change over the years, which was the case in Ribeirão Preto. The downward birthweight trend was more marked among highly educated women resulting in a decreased association between education level and birthweight. Even though the usual association between social position and birthweight persisted, the protective effect of high education level became less-pronounced over time. A similar effect was observed for marital status. These findings might indicate that unhealthy behaviour and exposures to factors that shorten gestation became more prevalent over time, particularly among women with high education level and married women. In the Brazilian context the extensive use of Caesarean section among women with high education level seems to play an important role in the downward trend in birthweight.

The Caesarean epidemic

Caesarean section is more hazardous than vaginal birth. The leading causes of maternal deaths related to the procedure include haemorrhage, pulmonary embolism, sepsis, and complications from anaesthesia. Furthermore, Caesarean section is associated with increased morbidity in the newborn, predominantly due to respiratory problems. Of special concern in the study by Silva et al. is the finding that Caesarean sections may also play an important role in preterm birth.

The WHO has recommended a maximum desirable rate of Caesarean section of 15%. Substantially higher rates have been reported from parts of Europe, USA, Asia, and South America. The world's highest rates, exceeding 70% in the private health sector, were reported from Brazil. The reason for the excess is a complex interplay between medical, psychosocial, and economic factors that may vary from country to country. There is a general trend of increasing use of medical technology, a broader range of indications, and a greater involvement of the woman herself in the decision-making process. In countries with very high Caesarean section rates such as Brazil, non-medical issues such as private care and high educational level play an important role. The essential question is: why do a large proportion of Brazilian women deliver for non-medical reasons by a procedure that is known to be more dangerous, more expensive, and requires a longer recovery than vaginal birth? Both women’s choice of a high-status mode of delivery that may appear easy, less painful and more convenient in the short term, and the doctor’s possibility of accommodating their working and leisure time by scheduling Caesarean sections have been discussed as possible contributing factors. However, recent evidence has shown that more than 70% of Brazilian women prefer a vaginal birth. Furthermore, anecdotal reports say that Brazilian doctors feel pressured to perform Caesarean sections. Both women and doctors could be trapped in a reimbursing and
financing system of health services that encourages a quick cut rather than the long hours of waiting associated with vaginal births, thus counteracting the best outcomes for mother and child.\(^{10}\)

Further studies addressing the role of Caesarean section in preterm birth are warranted. It would be desirable to extend such studies to include other populations with extraordinarily high rates. Premature rupture of membranes was the indication for 24% of the preterm Caesarean sections in Northeast Brazil, a condition traditionally handled by the induction of labour. This could be an example of how a biological justification may cover up a non-medical indication.\(^7\) The question of how the health services financing systems encourage Caesarean sections for non-medical reasons should be further explored. It is necessary to identify factors contributing to a reduction of population birthweight in order to inform public health interventions designed to increase birthweight in groups at risk. The paper by Silva \textit{et al.} makes it clear that information concerning Caesarean section is important in the study of risk factors associated with birthweight reduction.

References


