Maternal weight status before pregnancy is strongly associated with offspring weight status in childhood

Commentary on: Heslehurst, N., Vieira, R., Akhter, Z., et al. The association between maternal body mass index and child obesity: A systematic review and meta-analysis. *PLoS Medicine* 2019;**16**:e1002817. doi: 10.1371/journal.pmed.1002817.

Implications for practice and research

- When designing strategies to prevent childhood obesity, the weight status of women pre-pregnancy is a potential target for intervention.
- Research is needed to identify interventions that are effective in reducing the prevalence of maternal pre-pregnancy obesity.

Context

Obesity is associated with adverse health outcomes across life. The rise in its global prevalence is therefore one of the most important public health challenges of our time.(1)

Obesity tracks across life and so interventions to reduce its prevalence and minimise its lifelong consequences need to commence early in life.(2) Parental and offspring weight status are strongly associated(3) and it is recognised that intervening on these intergenerational associations may be an important strategy in reducing levels of childhood obesity.(4) Recent calls for greater recognition of the importance of women's health pre-pregnancy(5) suggest potential benefits of extending interventions focusing on the intergenerational transmission of obesity risk to women who may have children in the future.

However, evidence on the association between maternal pre-pregnancy weight status and offspring obesity risk needs to be synthesised.

Methods

Heslehurst and colleagues(6) followed established systematic review guidelines to identify all published studies examining associations between maternal pre-pregnancy body mass index (BMI) and offspring obesity, overweight or BMI in childhood. Relevant publications were identified by searching five databases and reference lists. After extracting all relevant data from eligible publications and requesting additional data, meta-analyses were performed.

Findings

A total of 79 studies met the inclusion criteria of the review. In meta-analyses of the primary outcome, childhood obesity, data from 20 studies including 88,872 children aged 1 to 14 years were pooled. These pooled estimates suggested that children who had mothers who were obese pre-pregnancy had 3.64 (95% CI: 2.68-4.95) times higher odds of being obese when compared with children whose mothers were normal weight. There was no evidence of publication bias but there was considerable heterogeneity between studies.

Commentary

The authors have synthesised a large and diverse body of evidence; a major undertaking for which they should be commended. While caution is required when interpreting the pooled effect estimates due to heterogeneity between studies, it is notable that associations between maternal pre-pregnancy and childhood offspring weight status were consistently observed.

Variation in the magnitude of association probably underlies the observed heterogeneity between studies. This variation is not surprising as meta-analyses included studies with different characteristics. When sources of heterogeneity were investigated, child age and the continent in which studies were conducted were identified as contributing factors.

Many studies were conducted in North America or Europe and associations were consistently stronger in European studies. Only limited data were available from low- and middle-income countries. Additional insights are likely to be gained from further research in other countries especially as childhood obesity is now a global phenomenon(1) but the most effective strategies to address this are likely to vary by country.

Stronger associations were observed at older childhood ages which the authors suggest *"…may reflect the combination of in utero and child life course exposures."* This implies that interventions to reduce childhood obesity should not only focus on the pre-pregnancy period but should continue throughout childhood.

Identifying the most effective timing and targets for intervention is challenging. Women's weight status is highly correlated across time and so unfortunately the review's findings on pre-pregnancy weight do not allow us to establish whether targeting women before, during or after pregnancy is likely to be most effective; though it is expected that providing support at all three stages would be beneficial. Additionally, paternal weight status which was 'rarely considered' in included studies should not be overlooked as intergenerational transmission of obesity is not limited to mothers.(4) Providing everyone of childbearing age with weight management support is therefore likely to contribute to the prevention of child obesity however, further work would be required to test the effectiveness of this.

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Competing interests

None