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Associations between dietary macronutrient composition in pregnancy and birthweight

SS Sharma[1], DC Greenwood[2], NAB Simpson[3], JE Cade[1]

[1]Nutritional Epidemiology Group, School of Food Science and Nutrition, University of Leeds, Leeds, UK

[2]Biostatistics Unit, Centre for Epidemiology and Biostatistics, University of Leeds, Leeds, UK

[3]Division of Obstetrics and Gynaecology, Leeds General Infirmary, Leeds, UK

Contact: fsss@leeds.ac.uk

Background

The developmental origins hypothesis posits that term infants who are small for their gestational age are at a high risk of developing chronic disease in adulthood as a consequence of poor adaptation to an adverse in utero environment, including nutrition. The aim of this study was to explore the associations between energy compositions from macronutrients consumed during first trimester of pregnancy and birthweight.

Methods

A prospective cohort of 1276 pregnant women aged 18-45 years provided a 24h dietary recall from the first trimester. Smoking habits and alcohol consumption were also assessed by questionnaire. A multiple linear regression model explored associations between percentages of energy derived from protein, fats and carbohydrates consumed in first trimester with birthweight as an outcome measure. The model was adjusted for confounders such as smoking, alcohol consumption, maternal weight, height, ethnicity, parity at booking, gestational age at delivery and gender of neonates.

Results

Each 1% increase in energy derived from carbohydrate consumption was associated with an increase in birthweight of 2.65 g (95% CI 0.10 to 5.20 g, p = 0.04). However, each 1% increase in energy derived from fat consumption was associated with a decrease in birthweight of -3.62 g (95% CI -6.61 to -0.63 g, p = 0.01). Unlike previous evidence supporting a possible impact of energy percentage derived from protein, no association was found in this cohort.

Conclusions

These preliminary results suggest a mutual relationship between percentages of energy derived from dietary fats and carbohydrates in maternal diets affecting birthweights of infants. The clinical relevance of this is uncertain, but further research

is required to identify the optimum balance between energy percentages derived from dietary carbohydrates and fat intakes.

Key messages:

- Unsupervised macronutrient intakes during pregnancy could be one of the potential factors affecting birthweights of infants
- Increased attention should be given towards maternal dietary patterns during pregnancy