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## Low glycaemic index diet in pregnancy and child asthma and eczema: follow-up of the ROLO trial

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Atopic diseases, including asthma and eczema, represent a substantial public health problem in children and adolescents globally; asthma is the commonest chronic disorder of childhood<sup>(1)</sup>. Research suggests that the origins of childhood asthma lie in utero, and several components of the maternal diet during pregnancy have been investigated in relation to atopic outcomes in children. Epidemiological evidence suggests that a higher intake of sugar during pregnancy is associated with a higher risk of childhood asthma and atopy<sup>(2,3)</sup>. However, randomised trial evidence supporting such a link is lacking.

### Aims

1. To examine whether a low glycaemic index (GI) dietary intervention during pregnancy decreases the risk of asthma and eczema in childhood.
2. To assess observationally whether maternal intake of sugar during pregnancy is positively associated with asthma and eczema in childhood.

This is a secondary analysis of children from the ROLO trial. Healthy women were randomised to receive an intervention of low GI dietary advice or routine antenatal care from early pregnancy. All women completed a 3-day food diary in each trimester of pregnancy. Estimates of maternal intake of sugar in each trimester were averaged to provide mean intakes during pregnancy. Mothers reported current doctor-diagnosed eczema in their children at 2-years of age (n=271), and current doctor-diagnosed asthma and eczema in their children at 5 (n=357) and 9-11 years (n=391) of age. Multivariable logistic regression models were used a) to test the effect of the intervention on child outcomes overall, and stratified by maternal education level (with, versus without, a complete tertiary level education), and b), in observational analyses, to analyse the relation between sugar and carbohydrate intake in pregnancy and child outcomes.

There was weak evidence overall for a reduction in asthma at 5-years of age in children whose mothers received the low GI dietary intervention during pregnancy compared to usual care [adjusted odds ratio (OR) 0.43 (95% CI 0.18, 1.03);  $P=0.06$ ]. However, in stratified analyses the intervention was associated with a marked reduction in risk of asthma at 5-years of age in children born to mothers with lower educational attainment [adjusted OR 0.16 (0.03, 0.85);  $P=0.032$ ]. Intake of sugar during pregnancy was positively associated with the development of asthma at any time point in childhood [adjusted OR per quartile of mean sugar intake 1.40 (0.99, 1.97),  $P$ -trend=0.048] and at 5-years of age [adjusted OR per quartile 1.55 (1.00, 2.40),  $P$ -trend=0.046]. No associations with eczema outcomes were found.

This novel study provides stronger evidence that higher sugar intake during pregnancy is associated with an increased risk of asthma among offspring. An intervention to reduce sugar intake in pregnancy may have potential as a primary prevention strategy, particularly amongst children born to mothers with lower educational attainment.

### References

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