

ASSOCIATION BETWEEN MATERNAL BLOOD LIPIDS DURING PREGNANCY AND OFFSPRING GROWTH TRAJECTORIES FROM 20 WEEKS' TO 5 YEARS

FINDINGS FROM THE ROLO STUDY

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BACKGROUND

Lipid metabolism is altered greatly during pregnancy with a increased lipid storage occurring during the first two trimesters, which is then released for use by the fetus during the third trimester. This lipid release coincides with the period of most significant fetal growth. Lipids are therefore a key substrate for fetal growth and development. Associations between growth trajectories from prenatal to postnatal life are not well understood.

AIMS

To examine associations between maternal lipid profiles in pregnancy and offspring growth trajectories.

METHODS

This is secondary analysis of the ROLO birth cohort (n=759). All infants were at risk of macrosomia (birthweight >4Kg). Total cholesterol (TC), high density lipoprotein cholesterol (HDL-Cholesterol), low density lipoprotein cholesterol (LDL-Cholesterol) and triglycerides were measured from fasting blood samples of mothers at 14- and 28-weeks' gestation. Fetal and child abdominal circumference (AC) and weight were measured at 20- and 34-weeks' gestation, birth, 6-months, 2-years, and 5-years. Associations between maternal lipid levels and trajectories of AC and weight from 20-weeks' gestation to 5 years among offspring were examined using linear spline multilevel models, including interaction terms to allow trajectories and the associations of lipids with trajectories to vary by sex.

RESULTS

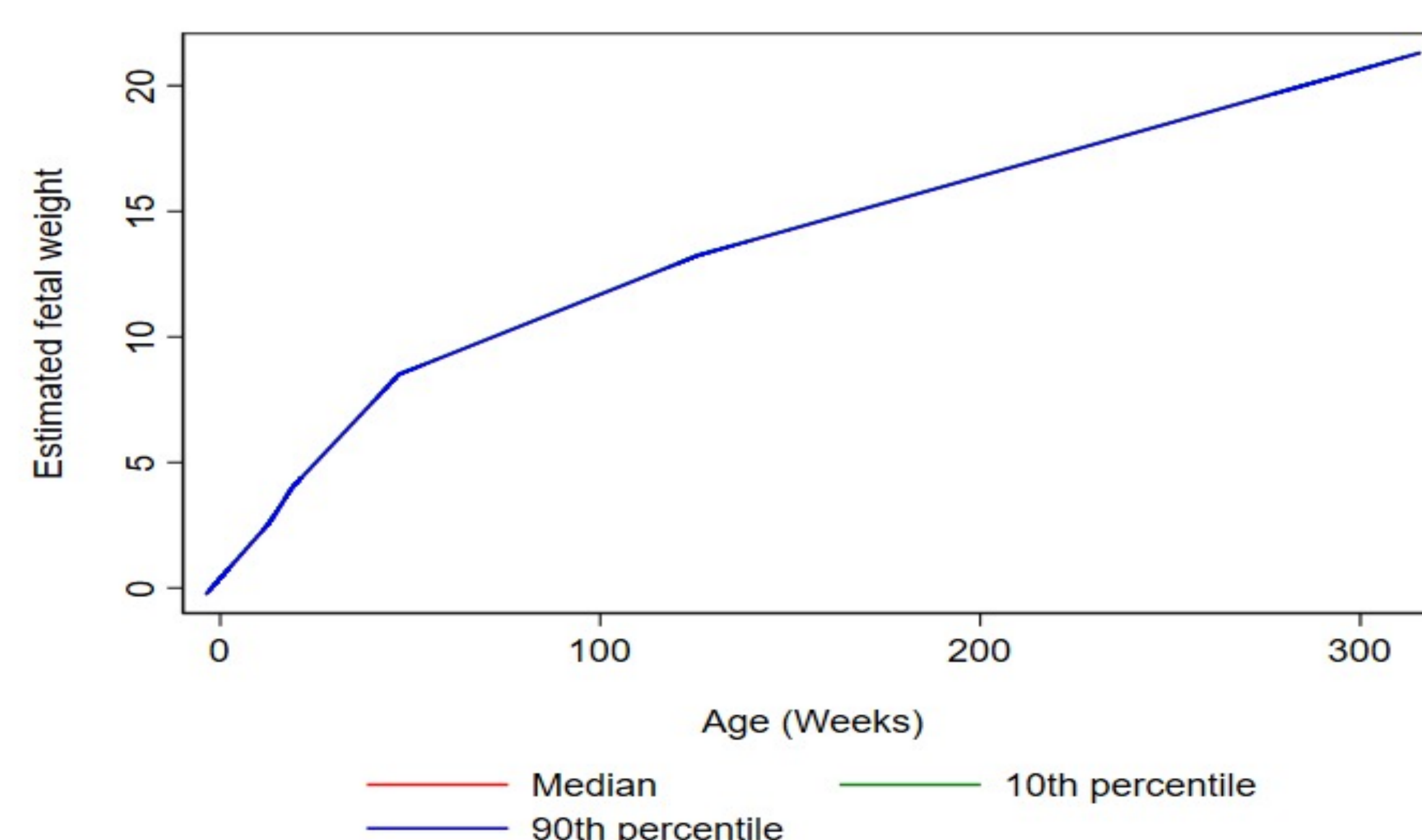
Table 1. Participant demographics of the Randomised cOntrol trial of a LOw glycemic index diet during pregnancy to reduce recurrence of macrosomia (ROLO study) included in this secondary analysis.

	Mean	SD
Mother's age (years)	32.92	3.84
Mothers BMI (kg/m ²)	26.15	4.54
HP index	6.70	9.41
Infant birthweight (kg)	4.07	0.50
Infant AC at birth (cm)	33.55	1.93
	n	%
Completed 3 rd level education	156	61.90
Caucasian ethnicity	261	91.90
RCT group		
Intervention	148	52.10
Control	136	47.90
Infant sex		
Female	148	52.10
Male	136	47.90
Infants with macrosomia	157	55.3%

RESULTS

Growth trajectories were formed from 20 weeks' gestation to 5 years of age for both infant abdominal circumference and weight.

Associations between lipids in early pregnancy and late pregnancy with offspring growth were assessed. No significant difference in offspring growth was noted with increasing lipid concentrations in either early or late pregnancy. This can be seen in the example graph of infant weight growth varying by total cholesterol below.



CONCLUSION

There were no associations between maternal lipid profiles and fetal and child growth trajectories from prenatal to postnatal life in this cohort. This suggests that manipulation of maternal lipids in pregnancies at risk for macrosomia may not impact on fetal and infant growth trajectories for infants already predisposed to macrosomia. Further exploration of lipids in more diverse pregnant cohorts is required, specifically among infants that are not predisposed to macrosomia.



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