Cholestatic pregnancy is associated with dynamic changes in total bile acids secondary to dietary intake – relevance for clinical diagnosis, management and underlying pathology

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Introduction

Intrahepatic cholestasis of pregnancy (ICP) is defined by the elevation of total bile acids in the presence of pruritus. There is no consensus on the optimal sampling time for bile acid measurement. We sought to determine the effects of a standardised diet on serial serum biochemistry for women with normal and cholestatic pregnancies, compared to non-pregnant women.

Methods

89 women were given a standardised diet for 24 hours, with serial phlebotomy performed, and samples analysed for total bile acids, glucose, lipids and gut hormones. Results were compared using multiple measures of ANOVA and student’s T tests.

Results

Fasting bile acid concentration ≥10µmol/L has 52% sensitivity and 100% specificity to diagnose ICP. Measuring post-prandial bile acids gives 79% sensitivity and specificity for the same threshold. Using a more stringent diagnostic criterion (bile acids ≥14µmol/L) post-prandially improves the specificity to 88%, but at the cost of lower sensitivity (59%). Using fasting bile acid concentrations to determine severity of ICP resulted in 13% sensitivity to diagnose severe ICP (bile acids ≥40µmol/L). Serum bile acid concentrations rise within 20 minutes of food, and remain elevated for at least 3 hours. Women with ICP demonstrate significant dyslipidaemia and altered gut hormone production.

Conclusions

Measuring fasting bile acid concentrations dramatically underestimates maternal (thus fetal) total bile acid exposure. The striking difference in fasting and post-prandial bile acid concentrations has implications for clinical management, given the association of serum bile acids ≥40µmol/L with adverse fetal outcomes. We confirm that ICP results in an adverse metabolic environment.