ORIGINAL ARTICLE

Second trimester amniotic fluid glucose, uric acid, phosphate, potassium, and sodium concentrations in relation to maternal pre-pregnancy BMI and birth weight centiles

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Abstract

Objective: To study the evolution profile of amniotic fluid (AF) glucose, uric acid, phosphate, potassium, and sodium, in the second trimester of pregnancy, and explore the possible relations between the concentration of these components and maternal, as well as neonatal characteristics.

Methods: AF of 52 pregnant women was analyzed using an automatic multichannel analyzer. Maternal age, pre-pregnancy Body Mass Index (BMI), inter-pregnancy intervals, and smoking status were derived from questionnaires. Information on pregnancy and delivery was collected from medical records.

Results: Uric acid increased ($r = 0.423, p<0.01$), while phosphate and glucose concentrations decreased during the period of 16-26th week of pregnancy ($r = -0.590, p<0.001$ and $r = -0.314, p<0.05$, respectively). Maternal pre-pregnancy BMI was significantly correlated with AF uric acid concentration ($r = 0.460, p<0.01$) and marginally with AF glucose ($r = 0.274, p = 0.052$) and sodium ($r = 0.254, p = 0.070$) levels. Multiple linear regression indicated that mid-trimester AF uric acid and phosphate levels were significantly related to birth weight centiles ($R^2 = 0.345, p<0.05$).

Conclusions: Our results suggest that: (a) AF phosphorus levels reflect gestational age to a satisfactory extent, (b) maternal pre-pregnancy BMI is significantly correlated with AF uric acid concentration, and (c) in appropriate for gestational age infants, AF phosphate and uric acid levels may serve as potential biomarkers of birth weight centiles. Further studies on AF composition may help to unravel the biochemical pathways underlying fetal development and could offer insight on the potential impact of maternal nutritional management on fetal growth regulation.

Keywords

Amniotic fluid, glucose, maternal pre-pregnancy Body Mass Index, phosphate, pregnancy, uric acid

History

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