

Neonatal arterial morphology in fetal growth abnormality

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Background: Fetal growth abnormalities are related with cardiovascular disease later during adulthood. Very little is known about the effect of fetal growth abnormalities on the cardiovascular phenotype during the newborn stage. The objective was to study the regional arterial morphology with respect to gestational age and newborn body morphometrics.

Methods and Results: We studied the arterial morphology of 156 newborns born between 31 and 42 weeks of gestation, including neonates small, large and appropriate for age birth weights, with very-high resolution vascular ultrasound (35-55 MHz). Statistically significant associations were observed between carotid, brachial and femoral arterial lumen dimension (LD), wall thickness (intima-media-adventitia thickness (IMAT), intima-media thickness (IMT)) and end-organ circumference, male gender, gestational age, body weight, and body surface area. In linear multiple regression models these explained a large proportion of the arterial variance (R² range 0.38 to 0.50 for LD; R² range 0.25 to 0.41 for IMAT; and R² range 0.15 to 0.25 for IMT; all models p<0.001). After adjustments, gestational age and male gender remained significant for all arterial LDs (p<0.01).

Conclusion: These preliminary results suggest that fetal arterial growth is primarily related to gender and gestational age.