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Aortic wall thickening and glomerulosclerosis in children born with IUGR

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Background and aims: Low birth weight, caused either by preterm birth and/or intrauterine growth restriction (IUGR), has recently been associated with increased rates of renal and cardiovascular disease in adulthood. Since aortic intima-media thickening (aIMT) is a non-invasive marker of preclinical vascular disease (Skilton MR et al. *Lancet* 2005; Cosmi E et al. *Obstet Gynecol* 2009) in IUGR neonates, we compared abdominal aIMT and glomerular function among IUGR and appropriate gestational age fetuses (AGA) in-utero and at 18 months of age.

Methods: Subjects were recruited between January 2009 and February 2011. The relationship between IUGR, fetal aIMT and glomerular function, particularly microalbuminuria (immunochromatographic method), creatininuria (Jaffé's method), ACR and related sodiuria (nephelometric method) during infancy was measured by enrolling 50 mothers with single-fetus pregnancies during third trimester ultrasound scan: 25 IUGR and 25 AGA as controls. aIMT was measured by ultrasound at enrollment and again at 18 months.

Results: Fetuses with IUGR had significantly higher abdominal aIMT compared with AGA controls when measured both in utero and at 18 months (2.05 ± 0.43 mm vs. 1.05 ± 0.19 mm, $P < 0.001$). At 18 months, values of ACR (26.92 ± 15.82 mg/gr vs. 14.78 ± 6.75 mg/gr, $P < 0.01$) and sodiuria (U Na/ Creat) (588.37 ± 565.01 μ M/L vs. 276.32 ± 172.55 μ M/L; $P < 0.01$) were significantly higher in IUGR infants.

Conclusions: Our results show that IUGR is associated with persistent aIMT and significantly higher microalbuminuria and sodiuria during infancy. These data may be early markers of increased renal and cardiovascular disease risk in later life.