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In This Issue

This issue of the *Journal of Developmental Origins of Health and Disease* contains two review articles and eight original articles. Two of the original articles utilize the ovine model, examining pulmonary and cardiac development, while two others utilize rodent models to explore mechanisms of developmental programming of obesity and inflammatory effects. The four original articles examining human populations include studies of gene polymorphisms and obesity, growth factors and microRNA in low birth weight offspring, and effects of the intrauterine environment on cognitive development. The review articles encompass assessments of the relationship between prenatal growth and postnatal outcomes, and explore the role of folic acid in fetal programming.

Reviews

Investigating the relationship between prenatal growth and postnatal outcomes: a systematic review of the literature. Norris and Cameron examined human studies reporting on ultrasound-derived estimates of fetal growth and association with offspring postnatal outcome. The results demonstrate that the second trimester represents a critical period for the programming of blood pressure and abdominal circumference.

The role of folic acid in fetal programming of birth phenotypes and early human development: a biopsychosocial perspective. Salihu *et al*. examined the epidemiology and evidence for folic acid as an intervention to reduce adverse birth phenotype expression. Although the authors found that epidemiological evidence on the role of folic acid supplementation and fetal programming is inconclusive, they propose a biopsychosocial model that may improve subsequent research studies.

Original Articles

Platelet-activating factor synthesis and receptor-mediated signaling are downregulated in ovine newborn lungs: relevance in postnatal pulmonary adaptation and persistent pulmonary hypertension of the newborn. Renteria and colleagues utilized the ovine model to demonstrate that downregulation of platelet-activating factor synthesis is needed for fetus to newborn pulmonary adaptation. The authors demonstrated a protective effect of platelet-activating factor downregulation against persistent pulmonary hypertension of the newborn.

Increased collagen deposition in the heart of chronically hypoxic ovine fetuses. Thompson and colleagues examined the collagen content of chronically hypoxic ovine fetuses. The authors demonstrated hypoxia-induced upregulation of collagen synthesis which may contribute to the right ventricular diastolic and systolic dysfunction reported in human growth restricted fetuses.

Epigenetic changes in hypothalamic appetite regulatory genes may underlie the developmental programming for obesity in rat neonates subjected to a high-carbohydrate dietary modification. Mahmood and co-authors examined epigenetic changes in appetite regulatory genes of rats weaned onto high carbohydrate milk formula. The authors demonstrated decreased acetylation of histone-3 in the POMC gene and increased acetylation for the NPY gene, consistent with epigenetic modifications contributing to hyperphagia.

Circulating levels of the cytokines IL10, IFNγ and resistin in an obese mouse model of developmental programming. Kępczyńska *et al*. explored the effect of maternal obesity on inflammatory cytokine markers in the pregnant dam. High fat-fed dams develop obesity, increased fat mass, glucose intolerance and increased pro-inflammatory cytokines. The authors postulate that adipokines and adipocytokines may directly pass to the fetus and alter fetal development.

Interplay between polymorphisms and methylation in the H19/IGF2 gene region may contribute to obesity in Mexican-American children. Hernández-Valero and colleagues examine mechanisms explaining the high prevalence of obesity among Mexican-American children. The authors reported that children with higher birth weights express lower methylation of a select CpG site in a region of the imprinted H19/IGF2 locus. These findings suggest that methylation status may be associated with childhood obesity in Mexican-American children.

Insulin-like growth factor-1 and lipoprotein profile in cord blood of preterm small for gestational age infants. Nagano and colleagues examine the population of preterm neonates for measures of cord blood IGF-1 and serum lipids. Small for gestational age preterm infants had lower levels of IGF-1 and reduced total cholesterol, low-density lipoprotein cholesterol and high-density lipoprotein cholesterol. These findings suggest that IGF-1 may be a critical contributor to the association of fetal development with offspring lipid regulation.

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Intrauterine environment and cognitive development in young twins. Antoniou and co-authors examined 663 twin pairs which completed the Wechsler Intelligence Scale. The authors found that twins with low birth weight and increased umbilical cord knots had lower IQ scores. The authors discuss the influence of both heritability and intrauterine growth on offspring intelligence measures.

Characterization of the role of microRNA-517a expression in low birth weight infants. Song *et al.* assess the expression of placenta-specific microRNA-517 in low birth weight newborns and maternal tissue. The authors demonstrate that miR-517a were significantly increased in placentas and maternal serum of low birth weight newborns, suggesting that this microRNA may potentially contribute to the etiology of low birth weight, postulated to be via inhibition of trophoblast invasion.

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