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In This Issue

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This issue of the Journal of Developmental Origins of Health and Disease contains one review article, 13 original articles and two brief reports. Of particular interest, Arbocco et al demonstrated a previously underexplored impact of maternal hypothyroidism on mammary gland development and function.

Review Articles:

The effects of resveratrol in cardio-metabolic disorders during pregnancy and offspring outcomes: A review. Lacerda and co-authors emphasize that resveratrol supplementation during pregnancy and lactation is associated with a reduced risk of maternal obesity, gestational diabetes and preeclampsia. The authors review the evidence and potential mechanisms of resveratrol intervention.

Original Articles

Exposure to p,p'-DDE during early pregnancy, anthropometry and gestational age at birth in a flower-growing region of Mexico. Torres-Sanchez et al examined the association between p,p'-DDE exposure in early pregnancy and infant outcomes. The authors found that prenatal exposure was not associated with the assessed birth outcomes. However, a high p,p'-DDE exposure was marginally associated with a greater small-for-gestational-age risk in male newborns. These findings suggest the potential differentiating effect of p,p'-DDE according to newborn sex.

Temporal and spatial development of intestinal smooth muscle layers of human embryos and fetuses. Liu and co-authors examine the process of gut smooth-muscle layer development in human fetuses, exploring the timing of the development of gut wall and lumen. This histological study clarifies the temporal pattern of development of the three smooth-muscle layers.

Maternal high-fat diet consumption during pregnancy and lactation predisposes offspring to renal and metabolic injury later in life: Comparative study of diets with different lipid contents. de Oliveira and colleagues utilized Wistar rats to examine the effect of varying lipid content high-fat diets. The authors demonstrate evidence of offspring renal damage, with effects dependent upon the dietary lipid content.

Relationships between maternal body mass index and child cognitive outcomes at 3 years of age are buffered by specific early environments in a prospective Canadian birth cohort. West et al utilize a prospective Canadian cohort to demonstrate that pre-pregnancy BMI was negatively associated with child full-scale IQ, though this impact was attenuated by higher maternal education and higher quality home environment. These findings indicate that early-life cognitive outcomes may be dependent upon maternal biological, social and environmental factors.

Association of serum and erythrocyte zinc levels with breastfeeding and complementary feeding in preterm and term infants. Azevedo-Silva et al compare serum and erythrocyte zinc levels in a group of preterm and full-term infants at 9 months of age in relation to dietary intake. The authors demonstrate that breastfeeding is associated with higher serum and erythrocyte zinc levels, though zinc levels were adequate in both pre-term and term infants.

Anthropometric proxies for child development in low-resource settings: Length- or height-for-age, head circumference or both? Lamb and associates explore two surrogate measurements for neurodevelopmental outcome (length- or height-for-age, head circumference). The authors conclude that measurement of head circumference may improve the precision of prediction of neurodevelopmental risk among infants.

Association between maternal prenatal psychological distress and autism spectrum disorder among 3-year-old children: The Japan Environment and children's Study. Nishigori and colleagues use a subset from the Japan Environment and Children's Study to assess the association between maternal psychological distress and ASD among 3-year-old children. The results demonstrate that continuous maternal psychological distress, from the first to the second half of pregnancy, was associated with increased ASD among 3-year-old children.

Developmental programming of mitochondrial substrate metabolism in skeletal muscle of adult sheep by cortisol exposure before birth. Davies and co-authors explore the effect of prenatal cortisol exposure on mitochondrial function in both biceps femoris (BF) and semitendinosus (ST) muscles. Cortisol-induced changes in mitochondrial function were present and more pronounced in the ST than BF muscle, with potential consequences for adult metabolism and energetics.

Associations of maternal glucose markers in pregnancy with cord blood glucocorticoids and child hair cortisol levels. Cohen and co-authors utilize two longitudinal pre-birth cohorts to assess relationship between maternal hyperglycemia and offspring cortisol levels in cord

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blood and hair samples during childhood. The results do not support the hypothesis that maternal hyperglycemia is associated with altered hypothalamic-pituitary-adrenal axis activity.

In utero Ramadan exposure and child nutrition. Chu and co-authors examine childhood stunting and underweight among children who are exposed to Ramadan fasting at any time during utero. Except for stunting in children who had in utero exposure to Ramadan fasting during the first months of pregnancy, there was no significant association between in utero exposure to Ramadan fasting and child stunting and underweight.

Robust determinants of neurocognitive development in children: Evidence from the Pune Maternal Nutrition Study. Yajnik and colleagues utilized data from Pune Nutrition Study to examine neurocognitive outcomes. The results highlight the critical role of parental education and socioeconomic background in determining child neurocognitive performance and suggest that adverse intrauterine influences on neurocognitive outcomes may be potentially reversible by post-birth remediations.

Long-term impact of hypothyroidism during gestation and lactation on the mammary gland. Arbocco et al examine the effect of rat hypothyroidism on the functional differentiation of the mammary gland. The authors demonstrate that a deficit in thyroid hormone throughout pregnancy and lactation impacts mammary development, including reduced progesterone receptor expression and an increase in non-malignant mammary tissue lesions. This study emphasizes the importance of thyroid hormone in mammary gland development and function.

Variation in placental micro-RNA expression associates with maternal family history of cardiovascular disease. Tehrani and colleagues assess microRNA in placentae from subjects in the Rhode Island Child Health Study. The results demonstrate an association between familial cardiovascular disease and differentially expressed microRNA expression, which may be linked to placental insufficiency.

Brief Reports

LHX6 promoter hypermethylation in oncological pediatric patients conceived by IVF. Dangoni and colleagues examine potential methylation changes in IVF offspring in relation to a link with pediatric cancer, as compared to control groups of healthy children and children conceived naturally who developed similar pediatric cancers. The results suggest that hypermethylation at the LHX6 promoter may be secondary to the IVF process.

Preeclampsia-induced alterations in brain and liver gene expression and DNA methylation patterns in fetal mice. Hofsink utilized a mouse model of sFlt1 administration to induce growth restriction in offspring. Altered DNA methylation in fetal brain and liver may have consequences of decreased hepatic gluconeogenesis and stimulated neurogenesis.

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