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In this issue

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In this issue

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This issue of the Journal of Developmental Origins of Health and Disease has 10 original articles, 3 reviews, and 1 brief report. Eleven of the papers focus on human studies of developmental programming with three additional papers utilizing animal models of experimentation.

Reviews

Birth size and cancer prognosis: a systematic review and meta-analysis. Sharma and colleagues reviewed the association between birth parameters and cancer mortality risk. The authors reported a significant association between birth weight and prognosis of cancer, with high birth weight associated with poorer prognosis of prostate cancer. The authors speculate that birth parameters may be associated with the risk of developing cancer but additional prospective studies are required.

The association between households' socioeconomic status, maternal sociodemographic characteristics, and adverse birth in infant growth and outcomes in sub-Saharan Africa: a systematic review. Ngandu *et al.* reviewed the associations between maternal demographic characteristics, socioeconomic status, and pregnancy outcomes with infant growth outcome in children under 2 years of age. Lower maternal education, unemployment, and low household wealth were most commonly associated with adverse birth outcomes and infant undernutrition.The results suggest that nutrition interventions should promote education and poverty alleviation in women at reproductive age, starting prepregnancy, to optimize ultimate infant growth and development.

The relationship of prenatal and infant antibiotic exposure with child overweight and obesity: a systematic review. The relationship of prenatal and infant antibiotic exposure with child overweight and obesity: a systematic review. Baron and authors examined the association between early-life antibiotic exposure in five studies of prenatal antibiotic exposure and four studies of infant antibiotic exposure. The review suggests some evidence, although varying, of the relationship between early-life antibiotic exposure and childhood overweight and obesity. However, additional well-designed studies are needed to clarify the association.

Original articles

Human studies

A new customized placental weight standard redefines the relationship between maternal obesity and extremes of placental size and is more closely associated with pregnancy complications than an existing population standard. Wallace *et al.* developed a regression model to predict placental weight from women based on height and weight. Both overweight and underweight mothers had increased risk of placental weight extremes. The customized placental weight standard demonstrated a higher risk of relative placental growth restriction leading to lower than expected birth weights in obese women. The authors suggest that assessment of the placenta may provide predictive value for development of SGA and LGA.

Associations of early-life growth with health using an allostatic load score in young, urban African adults: Birth to Twenty Plus Cohort. McGowan and Norris used an allostatic load to provide a quantitative measure of physiologic health. The results demonstrated that increased adiposity through childhood and adolescence in females was associated with a higher allostatic load in early adulthood. These results suggest that increased adiposity in early life may represent a sign of later physiological risk.

DNA methylation at LRP1 gene locus mediates the association between maternal total cholesterol changes in pregnancy and cord blood leptin levels. Guay and coauthors examined the association between maternal lipid increases during pregnancy, placental DNA methylation, and newborn anthropometric profile. Maternal total cholesterol changes during pregnancy were correlated with placental DNA methylation variations at LDLR and LRP1 genes, which itself correlated with newborn cord blood triglyceride and leptin levels. The results suggest that LRP1 DNA methylation may link maternal blood cholesterol changes in pregnancy with offspring adiposity at birth.

Does physical activity attenuate the association between birth weight and glycated hemoglobin in nondiabetic Japanese women? Aoyama *et al.*determined the association between birth weight and glycemic status in nondiabetic women, and whether activity alters the association in a group of Japanese women. Birth weight was inversely correlated with

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HbA1c hemoglobin, and linear regression revealed that lower birth weight was associated with increased HbA1c. The authors results suggest that lower birth weight may be associated with higher HbA1c levels before the onset of type 2 diabetes, irrespective of adulthood physical activity.

Exposure to placental insufficiency alters postnatal grown trajectory in extremely low birth weight infants. Chou and colleagues retrospectively examined 91 maternal–neonatal pairs to assess the role of placental insufficiency (defined by fetal Doppler studies) in postnatal weight gain in an extremely low birth weight (ELBW) population. The results demonstrated that (antenatal) placental insufficiency is a major determinant of postnatal weight trajectory in ELBW offspring.

Oocyte exposure to supraphysiological estradiol during ovarian stimulation increased the risk of adverse perinatal outcomes after frozen-thawed embryo transfer: a retrospective cohort study. Duan and coauthors examined the effect of high estradiol induced by controlled ovarian stimulation after frozen embryo transfer. The authors found that higher estradiol level was associated with lower percent of chemical pregnancy, clinical pregnancy, or live birth, and an increased frequency of early miscarriage, as well as preterm birth. The authors suggest that oocyte exposure to high estradiol during ovarian stimulation should be included in the assessment of patients due to the risk of preterm birth and SGA.

The association between birth weight and grandparental type 2 diabetes and cardiovascular disease in a multi-ethnic population. Kjollesdal and authors examined the intergenerational link of birth weight with cardiovascular disease and type 2 diabetes using the cohort study of pregnant women from Oslo, Norway (2008–2010). In logistic regression, higher birth weight *Z* score was associated with lower odds of type 2 diabetes among maternal and paternal grandmothers. Birth weight was not associated with cardiovascular disease. The results indicate an intergenerational transmission of the risk of chronic diseases in a multi-ethnic population.

The children of preterm survivors: shyness, parenting, and parental stress. Van Lieshout and coauthors note that ELBW survivors have high rates of shyness. The authors examine whether shyness and parenting stress mediated the relationship between the parenting styles and shyness in the offspring. The results indicate that perinatal adversity and stress (resulting in ELBW-associated shyness) may be transmitted to the next generation, potentially placing children at risk of later mental and physical health problems.

Animal studies

Brief report

Teratogenic effects of *Bocconia frutescens L.* Lunagomez *et al.* reports that *Bocconia frutescens L.* is a traditional medicine used to treat cough and GI disorders, though the plant contains alkaloids among other substances. The authors administered *B. frutescens L.* to pregnant rats during gestation day 7–13. Exposure resulted in significant increase in malformations indicating that *B. frutescens L.* during pregnancy may have a significant teratogenic risk.

Original articles

Long-term effects of maternal high-fat : high-fructose diet on offspring growth and metabolism, an impact of maternal taurine supplementation. Li and colleagues examined the effects of taurine supplementation on outcomes in a rat model of maternal obesity. Taurine supplementation reduced offspring adiposity in males but not in females and reduced plasma homocysteine concentrations among all maternal taurine supplemented groups. The authors conclude that maternal taurine can partially ameliorate adverse developmental programming effects among offspring of obese mothers.

Maternal folic acid supplementation does not counteract the deleterious impact of prenatal exposure to environmental pollutants on lipid homeostasis in male rat descendants. Navarro *et al.* examined whether prenatal folic acid supplementation can overcome deleterious effects of prenatal persistent organic pollutants (POPs) on lipid homeostasis and inflammation in three generations of male rat descendants. POP exposure of F0 rats increased plasma lipid at 14 weeks in F1 males and hepatic lipids at 28 weeks and decreased plasma triglycerides at 14 weeks in F2 males. Folic acid supplementation of F0 females lowered plasma cholesterol in F1 males but failed to attenuate the deleterious effects of prenatal POP on plasma and hepatic lipids in F1 males.

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