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In This Issue

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This issue of Journal of Developmental Origins of Health and Disease has an extraordinary 22 articles, including 2 brief reports, 18 original manuscripts, and 2 reviews. Due to the popularity of the journal and the support of our authors and readership, we have significantly expanded our page numbers for publication beginning in 2021. We encourage the continued excellence of submissions for journal review and publication.

Brief Reports

Perinatal maternal undernutrition does not result in offspring capillary rarefaction in the middle-aged male baboon at rest. Kuo et al. previously reported cardiovascular dysfunction in intrauterine growth- restricted baboon offspring. The authors tested the hypothesis that there is capillary rarefaction associated with induced IUGR. However, their studies demonstrated no difference between middle-aged male IUGR and control baboons in capillary fraction area or optical density. The authors discuss other possibilities for extracardiac capillary abnormalities.

Higher maternal weight is related to poorer fetal autonomic function. Christifano and colleagues investigated whether maternal obesity negatively influences fetal autonomic nervous system development in fetuses at 36 weeks' gestation. The authors demonstrated that higher maternal weight was associated with lower fetal heart rate variability, which indicates reduced autonomic nervous system development. These findings suggest that maternal obesity may predict long-term neurodevelopmental outcomes among offspring.

Review Articles

Early life risk and resiliency factors and their influences on developmental outcomes and disease pathway: A rapid evidence review of systemic reviews and meta-analyses. Abdul-Hussein and colleagues performed a systemic review of factors influencing developmental outcomes. The authors reported that studies examining social determinants of health and paternal influences were underrepresented, as were resiliency factors. The authors suggest that these gaps in knowledge can be further explored.

Epigenetic signatures associated with maternal body mass index or gestational weight gain: A systematic review. Opsahl et al. performed systematic search of the association between maternal BMI and/or gestational weight gain in DNA methylation or microRNA. The authors reported evidence that maternal BMI is associated with select epigenetic signatures of the mother, the placenta. and the offspring. which may explain some sequelae of developmental origins.

Original Articles

Periconception maternal low-protein diet adversely affects male mouse fetal bone growth and mineral density quality in late gestation. Lanham and colleagues utilized a mouse maternal low-protein diet to investigate effects on fetal bone development. The results demonstrate that fetal bone formation and mineral quality is dependent upon maternal nutritional protein content with sex-specific effects. A poor maternal diet may place offspring at increased risk of later bone disease.

A combined in vivo and in silico model shows specific predictors of individual transgenerational diabetic programming. Eberle and Ament examine predictable effects of trans-generational diabetic programming with complementary in vivo and in silico models. The results show that hyperglycemic in utero milieu contributes to transgenerational diabetic programming.

Translating developmental origins of health and disease in practice: Healthcare providers' perspectives. Molinaro et al. performed interviews with healthcare providers from varying health disciplines. Although providers expressed excitement over the potential health benefits of DOHaD counseling, they expressed concern on how and when to introduce the concept of DOHaD. The authors suggest that interaction and collaboration are needed between healthcare providers and researchers to support knowledge translation into practice.

The high-fructose intake of dams during pregnancy and lactation exerts sex-specific effects on adult rat offspring metabolism. Tobar-Bernal examined the effects of maternal fructose diet on female and male offspring. Pups of high-fructose diet- fed mothers showed increased levels of leptin and insulin resistance, which were more pronounced in male than in female offspring, though a higher increase in body weight was shown in female offspring. The authors discuss that high- fructose consumption by dams led to sex-specific developmental programming.

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Caregiver-reported physical health status of children and young people with fetal alcohol spectrum disorder. Reid and colleagues performed an online survey of caregivers of children with fetal alcohol spectrum disorder. The results demonstrate an increased risk of adverse health outcomes including eye conditions, asthma, heart conditions, and skin conditions in FASD children.

Association between maternal hypertensive disorders of pregnancy and child neural development at 3 years of age: A retrospective cohort study. Noda and colleagues assessed whether hypertensive disorders of pregnancy correlate with motor or mental developmental abnormality in 3-year-old children. Children born to mothers with hypertensive disorders did not have an increased risk of motor abnormalities, but did have an increased risk of mental developmental abnormalities. These findings suggest that early intervention programs may be of value.

Effect of maternal and postnatal cocoa supplementation on testicles of adult Wistar rats. Lima et al. studied the effect of maternal and postnatal cocoa powder supplementation on early weaned rat testicular morphology. Animals from early weaned control groups showed a reduction in tubular diameter and additional anatomic abnormalities. However, the animals from the early weaned cocoa-supplemented group showed a reversal of these changes indicating the preservation of testicular architecture.

Maternal exposure to low-to-medium altitude in birth outcomes: Evidence from a population-based study in Chinese newborns. Zhang and colleagues examined infants born from 2010 to 2013 in northwestern China. After adjusting for confounders, every 100-meter increase in altitude was associated with reduced birth weight by 6.4 g and an increased risk of SGA. These results suggest that low-to-medium altitude is possibly associated with adverse birth outcomes.

Correlation between newborn size and gross fetal movement as counted by a fetal movement acceleration measurement recorder. Yatsuki and colleagues sought to determine whether gross fetal movement is related to newborn size. The authors counted gross fetal movements using a fetal movement acceleration recorder during maternal sleep. Newborn weight was significantly correlated with fetal movement index suggesting that a person's lifetime activity level may originate in part from fetal development.

Insulin sensitivity in male sheep born to ewes treated with testosterone during pregnancy. Carrasco and colleagues examine the metabolic and reproductive outcomes of male offspring in females exposed to excess androgens. The authors demonstrated that prenatal exposure to excess testosterone may reprogram pancreatic cell insulin release in offspring males with effects more evident in castrated versus intact males.

Stressful life events: The incidents of infertility and the moderating effect of maternal responsiveness: A longitudinal study. Gleason et al. use data from the National Longitudinal Survey of Youth 1997 cohort to test association between stressful life events and infertility. The authors demonstrated a temporal association between the experience of stressful life events and self-reported infertility, potentially highlighting the importance of maternal behavior toward children in mitigating harms associated with stress over the life course.

Birth weight, childhood and adolescent growth, and diabetes risk factors in 21-year-old Asian Indians: The Pune Children's Study. Kumaran and coauthors studied 357 men and women from the Pune birth cohort. The authors demonstrated that lower birth weight and higher childhood weight gain increased offspring diabetes risk at the age of 21.

Neonatal parenteral nutrition affects the metabolic flow of glucose in newborn and adult male Hartley guinea pigs' liver. Teixeira and co-authors examined term male Hartley guinea pigs receiving parenteral nutrition with glutathione when compared to oral nutrition. The authors demonstrate that in adult male guinea pigs, neonatal exposure to parenteral nutrition impacted glutathione metabolism leading to a reductive stress and altered metabolic flow of glucose.

Intrauterine growth restriction predisposes to airway inflammation without disruption of epithelial integrity in postnatal male mice. Looi et al. used a model of maternal hypoxia-induced IUGR mice to assess lung-specific and systemic inflammation. Maternal hypoxia-induced IUGR increased inflammatory cells in the fluid of IUGR offspring and increased cytokine release specific to the lungs. These findings indicate that IUGR can influence susceptibility to airway disease.

Effects of maternal low-protein diet and spontaneous physical activity on the transcription of neurotrophic factors in the placenta in the brains of mothers and offspring rats. Fragoso and co-authors quantify gene expression in mothers' and fetuses' brains and placentae depending on maternal protein restriction and physical activity. Both maternal protein restriction and spontaneous physical activity influence gene expression of BDNF and IGF-1 with spontaneous physical activity normalizing, in part, defects caused by protein restriction during pregnancy.

Perinatal anxiety and depressive symptoms in perception of child behavior and temperament in early motherhood. Miller et al. examine the association between depressive and anxiety symptoms during the perinatal period and maternal perception of child behavior. The authors found that elevated anxiety symptoms have a distinct association with maternal report of child development and temperament. These findings suggest that approaches to help identify early life difficulties in mother–child interactions may be of benefit.

Biometric, nutritional, biochemical, and cardiovascular outcomes in male rats submitted to experimental model of early weaning that mimics mother abandoning. Barros et al. utilize a 3three-day early weaning model to induce both nutritional and emotional stress. Early weaned males presented higher body weight with subsequent assessment through 1one year of age, as well as dyslipidemia, higher blood pressure, and cardiac hypertrophy. These studies demonstrate that early maternal deprivation favors the development of cardiovascular disease.

Cardiometabolic disease risk among siblings of patients with major depressive disorder. Li and co-authors utilize the Taiwan National Health Insurance Research database to examine the association between metabolic and cerebro-cardiovascular diseases and major depressive disorders. The results show that unaffected siblings in patients with major depressive disorder were more likely to develop hypertension, dyslipidemia, ischemic stroke, and ischemic heart disease. These studies suggest a familial aggregation between depressive disorders and metabolic and cerebro-cardiovascular disease.

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