Journal of Developmental Origins of Health and Disease

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In This issue

Cite this article: Ross MG. (2021) In This Issue. *Journal of Developmental Origins of Health and Disease* **12**: 149–150. doi: 10.1017/S2040174421000143

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March 2021:

This issue of J DOHaD includes the 2019 DOHaD World Congress-themed issue on Fetal, Placental, and Pediatric Imaging, a result of the workshop at the 2019 World Congress. As noted in the attached editorial (JL Morrison, et al.), the themed issue papers highlight how advanced imaging techniques can provide valuable structural, functional, and developmental information for DOHaD research.

In addition to the themed issue, we present 3 comprehensive review articles, 11 original manuscripts, and a letter to the editor and reply.

Review Articles:

Repercussions of Maternal Exposure to High-Fat Diet on Offspring Feeding Behavior and Body Composition: A Systematic Review. Chaves et al. provide a comprehensive review of rodent studies in which mothers were provided a high-fat diet during pregnancy and lactation, pregnancy-only, and lactation-only. Maternal exposure to a high-fat diet led to increased offspring food intake, preference for high-fat diets, and early food independence. These findings demonstrate that maternal exposure to high-fat diets has adverse effects on offspring feeding behavior and body composition.

Excessive Early-Life Cholesterol Exposure May Have Later-Life Consequences for Nonalcoholic Fatty Liver Disease. Dumolt and co-authors review the process by which gestational hypercholesterolemia increases fetal hepatic lipid concentrations and alters lipid regulatory mRNA and protein content, changes which persist into adulthood. The authors conclude that early exposure to excess cholesterol during critical developmental periods can predispose offspring to development of nonalcoholic fatty liver disease.

Sleep-Disordered Breathing in Pregnancy: A Developmental Origin of Offspring Obesity? Farabi and co-authors review data in both rodent and human studies to characterize the impact of maternal sleep-disordered breathing on fetal development. Both rodent and human studies suggest that intermittent maternal hypoxia (rodents) or sleep-disordered breathing (humans) is associated with SGA or LGA which may predispose offspring to later obesity. Beyond maternal and fetal hypoxia, mechanisms may include inflammatory and oxidative stress pathways. Further prospective studies in humans are needed to examine the impact of this maternal sleep-disordered breathing.

Original Reports

Association between Early Weight Gain and Later Adiposity in Sri Lankan Adolescents. Samaranayake et al. performed a cross-sectional study in school-aged children. The authors found that children with accelerated weight gain between birth and 18 months had significantly higher BMI and fat mass index in adolescence. The authors suggest that optimal growth rates need to be determined for both normal, LGA, and SGA infants during early life to avoid long-term adverse consequences.

Infant Microbiota in Colic: Predictive Associations with Problem Crying and Subsequent Child Behavior. Loughman and colleagues examine the intestinal microbiota of infants with colic. The authors found that several taxa are associated with colic severity and could predict crying activity. These findings provide further evidence of the impact of infant gut microbiota in development.

Sex-Dependent Metabolic Effects of Pregestational Exercise on Prenatally Stressed Mice. Luft and colleagues examine the effects of pregestation exercise on metabolic changes induced by prenatal stress. The authors reported that pregestational exercise prevented stress-induced cholesterol increase in females and prevented select effects of prenatal stress on metabolic markers in a sex-dependent manner.

Examining the Trimester-Specific Effects of Low Gestational Weight Gain on Birth Weight: The BOSHI Study. Oba et al. quantify trimester-specific effects of low gestational weight gain on birth weight. The authors found that insufficient weight gain in the second and third trimesters had a negative impact on birth weight after adjusting for pre-pregnancy BMI.

Effective Maternal Hypothyroidism on the Gastrointestinal System of Male Young Offspring from Wistar Rats. de Rezende and co-authors used a model of methimazole-treated rats to examine the effects of maternal hypothyroidism. Maternal hypothyroidism impaired total body development as well as gastric and intestinal development with a resulting predisposition to intestinal ulcers.

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The Impact of Maternal Periodontitis in the Development of Asthma in the Offspring. Rodrigues and co-authors utilized a rat model of periodontitis (ligature technique). When sensitized and challenged to produce an asthmatic response, offspring of periodontitis dams had a reduced allergic and inflammatory response. The immune suppression findings may extend to other offspring organ systems.

Assessing the Potential of a Virtual Patient Advocate to Provide Preconception Care and Health Advice to Women Living in Australia. Walker and colleagues used a virtual patient advocate (VPA) to increase women's access to preconception care. Participants had strong opinions about technological advancements and demonstrated that VPAs can provide enhanced preconception advice.

Neonatal Glucocorticoid Overexposure Alters Cardiovascular Function in Young Adult Horses in a Sex-Linked Manner. Valenzuela et al. induced neonatal cortisol overexposure by ACTH hormone administration to full-term male and female foals. At 2 to 3 years of age, neonatal cortisol overexposure reduced both pressor and bradycardic responses to phenylephrine in males, but not females, and enhanced the initial hypotensive response to nitroprusside in females, but not in males. These results demonstrate glucocorticoid programming of cardiovascular function during the immediate neonatal period.

Determination of Saliva Epigenetic Age in Infancy, and its Association with Parental Socioeconomic Characteristics and Pregnancy Outcomes. Popovic and colleagues collected saliva samples of infants from the NINFEA birth cohort to examine DNA methylation age. The results did not reveal clear associations between pregnancy outcomes or parental socioeconomic characteristics and salivary epigenetic age acceleration. However, DNA methylation age can be fairly accurately predicted from salivary samples in the first months of age.

Extremely Low Birth Weight Influences the Relationship between Stress and Telomere Length in Adulthood. Savoy and co-authors examine markers of stress vulnerability (salivary cortisol and frontal EEG) and telomere length among extremely low birth weight and normal birth weight participants (at the age of 30 to 35 years). Salivary cortisol and EEG frontal asymmetry predicted later telomere length among normal birth weight controls, though not low birth weight survivors. These results suggest the role of stress in the genesis of cellular senescence among offspring born normal birth weight.

A Population-Based Case-Control Study of the Association between Weather-Related Extreme Heat Events and Low Birth Weight. Lawrence et al. investigate the impact of prenatal extreme heat events on birth weight by trimester in New York State. Extreme heat events in the first trimester were associated with significant reduction in mean birth weight among term low birth weight infants. The authors recommend pregnant women to avoid extreme heat exposure, particularly during the first trimester.

Letter to the Editor

Answers to Complex Problems Require Comprehensive and Accurate Data: Rimvall and colleagues comment on the paper, "Latent Factors of Adverse Childhood Experiences and Adult-Onset Asthma" by Ospina et al.

Reply to letter to editor, Ospina et al.

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https://doi.org/10.1017/S2040174421000143 Published online by Cambridge University Press