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In this issue

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In This Issue

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This issue of Journal of Developmental Origins of Health and Disease includes three superb review articles, seven original manuscripts, and two brief reports. Among the reviews, McKerracher focuses on an increasingly important issue of how we translate DOHaD knowledge into public health approaches.

Review articles

Attenuation of maternal weight gain impacts infant birth weight: Systematic review and Meta-analysis. Bennett et al reviewed the effect of interventions, which seek to reduce excessive weight gain during pregnancy, on infant anthropometric outcomes. Diet and lifestyle interventions led to a small reduction in infant birth weight and risk of macrosomia and LGA without increasing the risk of SGA. Thus, lifestyle and dietary interventions which reduce excessive gestational weight gain are of potential value particularly for patients with gestational diabetes.

The relationship between maternal obesity and diabetes during pregnancy on offspring kidney structure and function in humans: A systematic review. Lee and colleagues examined literature assessing intrauterine exposure to maternal obesity and/or diabetes on offspring renal function and adult kidney disease. Although the authors determined there were limited high-quality studies, the current evidence is consistent with an adverse renal effect of maternal obesity and/or diabetes. Additional high-quality prospective cohort studies are necessary to address this increasingly important risk factor.

Translating the developmental origins of health and disease concept to improve the nutritional environment for our next generations: A call for a reflexive, positive, multi-level approach. McKerracher and associates examined reports of DOHaD knowledge translation programs, determining if DOHaD knowledge is applied to everyday home or work lives. The authors review potential benefits (e.g., empowerment) and critiques (e.g., overburdened responsibilities) of DOHaD knowledge translation programs. Challenges remain as to how to initiate DOHaD knowledge translation programs throughout the life course.

Original articles

Relationship between prenatal and postnatal conditions and accelerated postnatal growth. Impact on the rigidity of the arterial wall and obesity in childhood. Mora-Urda and coauthors examined the effect of accelerated postnatal growth and risk factors. Children with accelerated postnatal growth were born of women with lower BMIs before pregnancy, and had a shorter duration of breast feeding. During childhood, these offspring exhibited higher BMI and a higher prevalence of hypertension. These findings provide further evidence of the potential adverse effects of accelerated postnatal weight gain.

Elective cesarean delivery at term and the long-term risk for endocrine and metabolic morbidity of the offspring. Moshkovsky et al examined a population-based cohort of singleton term deliveries between 1991 and 2014. Among infants born via cesarean there was an increased incidence of endocrine metabolic morbidity, though this association did not remain when adjusted for maternal obesity. However, maternal obesity itself emerged as a strong predictor of offspring endocrine metabolic morbidity. The potential mechanism by which maternal obesity, mode of delivery, and microbiota influence offspring metabolic function is discussed.

First trimester maternal exposures to endocrine disrupting chemicals and metals and fetal size in the Michigan mother–infant pairs study. Goodrich and colleagues performed a pilot study to assess exposure to EDCs and metals among pregnant women in the first trimester and examined associations with fetal biometry. Monophthalate exposure was significantly associated with higher birth weight while bisphenol S was associated with lower birth weight. Estimated femur length (ultrasound) was inversely associated with metal exposure. This program will continue to provide additional exposure and biologic outcome results for environmental toxicants.

Maternal undernutrition results in altered renal pro-inflammatory gene expression concomitant with hypertension in adult male offspring that is ameliorated following pre-weaning growth hormone treatment. Zhang and coauthors previously showed that growth hormone treatment of maternal undernutrition-exposed offspring can prevent later development of cardiometabolic disorders. In the present study, the authors demonstrate that growth hormone treatment reduced renal pro-inflammatory gene expression and normalized renal

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development. This report continues the exploration of the development of therapeutic strategies to reduce the adverse effects of intrauterine programming.

Offspring from maternal nutrient restriction in mice show variations in adult glucose metabolism similar to human fetal growth restriction. Radford and Han examine the effects of maternal nutrient restriction on offspring glucose metabolism. The authors demonstrate that maternal nutrient restriction results in fetal growth restriction and long-term glucose intolerance, similar to findings in human fetal growth restriction.

High maternal milk intake in the postnatal life reduces the incidence of breast cancer during adulthood in rats. Santiano and coauthors randomized newborn rats to differential consumption of breast milk. The mitotic responses to dimethylbenzanthracene were significantly increased in low maternal milk intake groups. These results suggest that higher maternal milk intake may reduce breast tumor development or growth.

Being born small for gestational age is associated with an unfavorable dietary intake in Danish adolescent girls: Findings from the Danish National Birth Cohort. Kampmann and coauthors utilized the Danish National Birth Cohort to examine dietary intake from adolescence born SGA vs. AGA. Girls born SGA, though not boys, had an unfavorable dietary intake compared with AGA girls, with effects persisting after controlling for confounders. These findings suggest a possible fetal programming effect on dietary intake and/or food preference.

Brief reports

Renal developmental disturbances in their long-term consequences in female pups from vitamin D-deficient mothers: Involved mechanisms. Almeida et al examined female rat offspring from mothers fed a vitamin D-deficient diet. As compared to controls, vitamin D-deficient offspring had higher systolic blood pressure and plasma angiotensin levels, as well as altered renal gene expression. The authors propose that vitamin D deficiency may impact on angiogenesis and angiotensin alterations.

Beneficial effects of maternal swimming during pregnancy on offspring metabolism when the father is obese. Tarevnic and coauthors examined the effect of maternal exercise training on offspring metabolism associated with paternal obesity. With a protocol of maternal swimming, the authors demonstrated that maternal exercise had a significant beneficial effect on offspring of obese fathers. These findings contribute importantly to the evidence of the epigenetic effect of paternal obesity on offspring programming.

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