Journal of Developmental Origins of Health and Disease

cambridge.org/doh

In this issue

Cite this article: Ross MG. (2018) In this Issue. *Journal of Developmental Origins of Health and Disease* **9**: 473–474. doi: 10.1017/S2040174418000727

In This Issue

This issue of the Journal of Developmental Origins of Health and Disease includes 12 publications, including nine original reports, two brief reports and one Letter to Editor. Two of the original report focus on programming of male reproductive function, examining the effects if environmental exposures during development, while the Letter to Editor updates the meta-analysis of human studies exploring effects of donor sperm.

Brief reports

LifeLab Southampton: a programme to engage adolescents with DOHaD concepts as a tool for increasing health literacy in teenagers – a pilot cluster – randomized control trial. Woods-Townsend *et al.* sought to examine if engaging adolescents with Developmental Origins of Health and Disease (DOHaD) concepts improve scientific literacy and health behaviors. Using school-based randomization, intervention students showed greater understanding of DOHaD concepts but no sustained changes in behavior. As the authors conclude that knowledge is easier to acquire than to act upon, they are now seeking to embed behavioral change in their program.

The affected maternal intake of sucrose or high-fructose corn syrup (HFCS-55) during gestation and lactation on lipogenic gene expression in rat offspring at 3 and 12 weeks of age. Kaur *et al.* determines the sex-specific effects of maternal consumption of sucrose or HFCS-55 on the expression of hepatic lipogenic genes in offspring. Based on the hepatic expression of genes at 3 and 12 weeks of age, the authors conclude that perinatal exposure to sucrose may be more detrimental to offspring hepatic metabolism compared to high-fructose corn syrup.

Original reports

The significance of DOHaD for small island developing states. Tu'akoi *et al.* discuss the impact of DOHaD on small island developing states (SIDS), focusing on the Cook Islands. The authors note that research on early life non-communicable disease risk in SIDS as well as many low- and middle-income countries is scarce. The authors propose utilizing smaller, geographically relevant sample size encompassing a high proportion of the total population to further studies among these countries.

Up-regulation of renal renin-angiotensin system and inflammatory mechanisms in the prenatal programming by low-protein diet: beneficial effect of the post-weaning losartan treatment. Watanabe *et al.* sought to examine the effects of a maternal low-protein diet on proinflammatory cytokines, reactive oxygen species and the renin-angiotensin system in offspring of the maternal low-protein diet. Hypothesizing that post-weaning losartan treatment would have beneficial effects, pups were randomly assigned to a losartan or control group. A low-protein diet resulted in higher offspring blood pressure and activation of renal RAS at 20 weeks of age. Post-weaning losartan treatment normalized the intrarenal RAS activation. These results suggest that prenatal programming of hypertension is dependent upon up-regulation of local RAS and may be normalized by AT1 receptor blockade.

Anxiety-like behavior and structural changes of the bed nucleus of the stria terminalis (BNST) in gestational protein-restrictive male offspring. Torres *et al.* examined if BNST structural changes and neurochemical alterations were associated with anxiety-related behavior in adult offspring of protein-restricted dams. In rats subjected to gestational protein restriction, there was a significant reduction in dendritic length and arborization, elevated plasma corticosterone and increased anxiety-like behavior. These results suggest that BNST developmental plasticity may be adversely impacted by maternal protein restriction.

Undernutrition in childhood resulted in bad dietary behaviors and the increased risk of hypertension in a middle-aged Chinese population. Zhang *et al.* examined 1756 subjects age 45–60 years in the Hefei nutrition and health study, divided by self-reported animal food intake during growth periods. The results indicate the nutritional deficiency in childhood was associated with poor dietary behavior and a significantly increased risk of hypertension in middle-age, though no difference in diabetes or obesity.

© Cambridge University Press and the International Society for Developmental Origins of Health and Disease 2018.

CAMBRIDGE UNIVERSITY PRESS

Pulsatile hyperglycemia increases insulin secretion but not pancreatic β B-cell mass in intrauterine growth-restricted fetal sheep. Boehmer *et al.* utilized a model of ovine intrauterine growth restriction (IUGR) to determine if the β cell numbers and insulin secretion could be increased by pulsatile hyperglycemia. IUGR fetuses were administered a pulsatile hyperglycemic infusion and compared to their co-twins. Although there were no differences in islet size, the insulin area of the pancreas, the islets and β cell mass, chronic pulsatile hyperglycemia increased early insulin secretion in response to acute hyperglycemia indicating that IUGR fetal β cells are responsive to hyperglycemia.

Neonatal intake of oleanolic acid attenuates the subsequent development of high-fructose diet-induced non-alcoholic fatty liver disease in rats. Nyakudya *et al.* investigated the potential hepatoprotective effects of neonatal oleanolic acid (OA) on the development of dietary fructose-induced NAFLD. Male and female suckling rats were exposed to high-fructose solution with and without OA and exposed a second time at day 56 to a high-fructose diet. Treatment with OA during a critical window of developmental plasticity prevented the development of fructose-induced NAFLD. These findings support the opportunity for dietary supplementation with OA during the neonatal period.

Prenatal exposure to an environmentally relevant mixture of Canadian arctic contaminates decreases male reproductive function in an aging rat model. Maurice *et al.* gavage fed female rats with an arctic organochlorine (OC) mixture from mating to parturition. At 1-year of age, OC F1 males had reduced reproductive organ weights and lower sperm quality. These findings indicate that environmentally relevant prenatal OC exposure may have adverse reproductive health effects on aging male rats.

Impact of a gestational exposure to diesel exhaust on offspring gonadal development: experimental study in the rabbit. Bourdon *et al.* examined the effect of daily exposure to diluted diesel exhaust gas during the gestational period in rats. Gonads were examined at day 28 of gestation or 7–1/2 months of age. Among histologic and endocrine responses, only the sperm DNA fragmentation rate was increased threefold in exposed males. The question remains as to whether DNA strand breaks inherited from the paternal genome would impact the development and health of subsequent offspring.

Maternal smoking and low family income during pregnancies as predictors of the relationship between depression and adiposity in young adults. Baht utilized the Western Australian pregnancy cohort (RAINE) study to examine the association of offspring depression and body mass index (BMI). There were significant interactions between maternal prenatal smoking, depression scores, BMI and low family income. These results suggest potentially important maternal behavioral and socio-economic factors that may predispose offspring to obesity and depression in early adulthood.

Letter to the editor

Update on: a meta-analysis of sperm donation offspring health outcomes – 2018 update. Adams *et al.* provide a follow-up from their 2017 meta-analysis of health outcomes of offspring conceived from donor sperm. The addition of new studies has demonstrated an increased risk of donor sperm-conceived neonates being born of low birth weight and with birth defects. It is unclear whether this increased risk is a result of the increased incidence of preeclampsia in donor sperm cohort, use of sperm cryopreservation techniques, ovarian stimulation drugs or obstetric interventions.

Michael G. Ross
Editor-In-Chief
Journal of Developmental Origins of Health and Disease (J DOHaD)

https://doi.org/10.1017/S2040174418000727 Published online by Cambridge University Press