

In This Issue

The October issue of the *Journal of Developmental Origins of Health and Disease* reflects the increasing volume and quality of manuscript submissions to the Journal. This issue contains two excellent review articles, three fast track publication related to the 2011 DOHaD meeting, and 8 original articles, including studies of both animal and human programming.

Reviews

Perinatal overnutrition and the programming of food preferences: pathways and mechanisms. Ong *et al.* present a timely review focusing on the programming of food preferences as a result of the mesolimbic reward system. In view of recent attention on limiting availability of high fat and high sugar foods in schools and the size of fast food soft drink containers (New York City), this paper provides important insights into the likely success of these programs.

Nick Hales Award Lecture 2011: glucocorticoids and early life programming of cardiometabolic disease. Reynolds presents a review based upon the Nick Hales Award Lecture at the 2011 International DOHaD conference. Evidence indicates that activation of the hypothalamic–pituitary–adrenal (HPA) axis is associated with increased susceptibility to cardiovascular risk factors, and fetal exposure to excess glucocorticoids may impact on the development of the HPA axis. Increased maternal cortisol, resulting from stress in pregnancy, as well as intrinsic deficiencies in placental 11 β -hydroxysteroid dehydrogenase type 2, may impact fetal glucocorticoid levels.

Fast Track Papers

Periconception maternal smoking and low education are associated with methylation of *INSIGF* in children at the age of 17 months. Obermann-Borst *et al.* measured DNA methylation in white blood cells from children at 17 months of age. Periconception smoking and low maternal education level were associated with a relative increase in methylation of insulin pathway genes, particularly *INSIGF*, the overlapping region of *IGF2* and insulin. The potential for modification of gene expression as adults may influence predisposition to glucose intolerance.

Maternal protein restriction in pregnancy and/or lactation affects seminiferous tubule organization in male rat offspring. Rodriguez-Gonzalez *et al.* utilized a maternal low-protein diet during pregnancy and/or lactation to examine

seminiferous tubule development. Maternal protein restriction delayed germinal epithelium development and androgen receptor expression, suggesting a potential mechanism for lower fertility rates in adult offspring.

Maternal folate, alcohol and energy metabolism-related gene polymorphisms and the risk of recurrent pregnancy loss. Sata *et al.* utilized a case controlled study model of women with recurrent pregnancy loss and controls. The authors demonstrated that the risk of recurrent pregnancy loss decreased with select nucleotide polymorphisms of folate, alcohol and energy metabolism-related genes.

Original Articles

The effect of hypoxia-induced intrauterine growth restriction on renal artery function. Verschuren *et al.* utilized a model of hypoxic rat dams to create intrauterine growth restricted offspring. Renal vascular responses to vasodilators and vasoconstrictors were altered by fetal hypoxic exposure in a sex-dependent manner, though not associated with gross changes in renal morphology.

Increased systolic blood pressure in rat offspring following a maternal low-protein diet is normalized by maternal dietary choline supplementation. Bai *et al.* utilized a maternal low-protein diet that results in offspring with increased blood pressure, to examine effects of maternal choline supplementation. The authors demonstrate that maternal rats with low-protein levels supplemented with choline produced offspring with systolic blood pressure and fat mass that were similar to controls. A potential mechanism was elucidated by the demonstration that offspring of choline-supplemented dams had lower levels of homocystine concentrations.

Effects of hypoxia-induced intrauterine growth restriction on cardiac siderosis and oxidative stress. Rueda-Clausen *et al.* utilized hypoxia-induced intrauterine growth restricted (IUGR) offspring to examine myocardial markers of oxidative stress by myocardial remodeling. The results demonstrated that hypoxia-induced IUGR produces adverse effects in a gender-specific manner, with effects in male though not female offspring.

Maternal lipopolysaccharide alters the newborn oxidative stress and C-reactive protein levels in response to an inflammatory stress. Ginsberg *et al.* examine the effects of maternal lipopolysaccharide on offspring oxidative stress and

inflammatory responses in rats. Offspring of lipopolysaccharide (LPS) dams had significantly higher basal oxidative stress levels, and greater C-reactive protein responses to postnatal LPS exposure. These findings indicate that maternal inflammation during pregnancy may program offspring inflammatory responses.

Maternal protein restriction before pregnancy reduces offspring early body mass and affects glucose metabolism in C57BL/6J Bom mice. Dudele *et al.* utilized female mice receiving a low-protein diet prior to conception, though with a control diet during pregnancy. Body mass of low-protein male offspring was lower at weaning, and 2-week-old male and female offspring demonstrated enhanced insulin sensitivity. The authors suggest that maternal protein restriction prior to pregnancy produces effects similar to post-conceptual malnutrition.

No increased risk of psychological/behavioral disorders in siblings of women with hyperemesis gravidarum (HG) unless their mother had HG. Having previously shown that *in utero* exposure to hyperemesis may lead to increased risk of psychological and behavioral disorders in offspring, Mullin *et al.* examined adults with and without a sibling with hyperemesis gravidarum. The results suggest that the increased incidence of psychological behavioral disorders

among offspring of women with hyperemesis is attributable to the hyperemesis pregnancy itself, rather than to genetic factors associated with hyperemesis.

Early cohort mortality predicts the rate of aging in the cohort: a historical analysis. Beltrán-Sánchez *et al.* analyzed the associations between early life mortality and later life mortality/aging. The authors suggest that effects of exposure to infection or poor nutrition, which largely influence early life mortality, persist into mid-adulthood and impact later mortality rates.

Rate and pattern of weight gain in Indian women from the upper income group during pregnancy and its effect on pregnancy outcome. Raje and Ghugre examine Indian women from upper income status, demonstrating that weight gain in the first trimester and the third trimester was significantly correlated with newborn birth weight. The authors conclude that adequate maternal nutrition before and during pregnancy is important for adequate weight gain by the mother and may optimize newborn outcomes.

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