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In This Issue

This issue of the *Journal of Developmental Origins of Health and Disease* contains two excellent review articles, one fast-track publication and seven original articles. Our original articles this month focus on human DOHaD studies, including experimental studies, epidemiologic reports, epigenetic analyses, and studies of knowledge translation and behavior change.

Reviews

Behavioral epigenetics and the developmental origins of child mental health disorders. Lester *et al*. review the epigenetic principals related to developmental programming and utilize a model illustrating how epigenetic changes in placental genes can alter infant neurobehavioral profiles. An understanding of the mechanisms by which epigenetic changes can occur and result in altered offspring health and disease is essential to the concepts of developmental origins.

Placental fatty acid transport in maternal obesity. Maternal obesity is a risk factor for significant pregnancy adverse outcomes, including fetal macrosomia. Cetin *et al*. review the processes by which maternal obesity can influence placental fatty acid transport, including expression of fatty acid carriers and inflammatory signaling molecules. The authors raise important questions as to whether the placenta limits the transfer of fatty acids and whether transfer is influenced by maternal to fetal gradients.

Fast Track Article

Association between infant nutrition and anthropometry, and pre-pubertal body composition in urban South African children. Kagura *et al*. investigate the association between nutrition and growth during infancy and body composition at 10 years of age in a cohort from South Africa. The authors demonstrate that stunting at one year of age was associated with lower fat mass at 10 years of age, while underweight at one year of age was associated with lower lean mass. These studies emphasize the complexity of developmental programming, with influence of both prenatal and infant nutrition.

Original Articles

Response to an aerobic training intervention in young adults depends on ponderal index at birth. Brutsaert *et al*. examined two cohorts of 20-year-old adults, born with either high or low ponderal index, to assess the association of birth phenotype with adult responses to aerobic training. Low ponderal index adults demonstrated significantly lower pre-training lactate levels, speculated to reflect metabolic programming secondary to intrauterine growth restriction or altered muscle morphology and/or fiber-type.

Maternal experiences of racial discrimination and child weight status in the first 3 years of life. Dixon *et al*. utilized data from Project Viva to assess the association of maternal experiences of racial discrimination with infant birth weights. The authors found that mothers' report of increased racial discrimination was associated with lower fetal growth, weight at 3 months of age and body mass index at 3 years of age in the offspring. Although the mechanisms for these associations are uncertain, the results suggest that maternal experiences of racial discrimination may impact offspring health.

Measures of birth size in relation to risk of prostate cancer: the Malmö Diet and Cancer Study, Sweden. Lahmann *et al*. utilize birth record data among men born from 1923 to 1945 in Sweden. The results suggest a protective effect of lower birth weight on the risk of both total and aggressive prostate cancer, with a non-linear relationship between birth weight and prostate cancer. Consistent with prior studies, cancer in men may be influenced by the intrauterine environment.

Prenatal famine exposure, health in later life and promoter methylation of four candidate genes. Veenendaal *et al*. examined peripheral blood DNA methylation status of select genes in 58-year-old subjects born during the Dutch famine. The authors reported that hypomethylation of the glucocorticoid receptor promoter was associated with adverse adult lifestyle factors, including higher body mass index, less exercise and increased smoking, though there was no difference in methylation levels between famine-exposed and unexposed men and women. These results suggest that the adult environment may impact on select gene promoter methylation, consistent with the plasticity of epigenetic regulation.

Grandparental morbidity and mortality patterns are associated with infant birth weight in the Lifeways cross-generation cohort study 2001–2010. Shrivastava *et al*. investigated the association of grandparent-to-infant risks utilizing a three-generation familial cohort. Maternal grandfather mortality was significantly associated with high infant birth weight, while maternal grandparent mortality was associated with low infant birth weight. These findings

are consistent with an intergenerational transmission of risk factors, though with differing effects in maternal and paternal lines.

Adolescent understanding of DOHaD concepts: a school-based intervention to support knowledge translation and behavior change. Bay *et al*. initiated a school-based education intervention, focusing on the understanding of DOHaD concepts. The authors demonstrated that an understanding of the link between maternal diet during pregnancy and health of the fetus in adulthood increased significantly following the intervention. Further work on the sustainability of education interventions and the impact on fetal and adult health will be of great interest.

Developmental programming of aging of isolated pancreatic islet glucose-stimulated insulin secretion in female offspring of mothers fed low-protein diets in pregnancy and/or lactation. Utilizing female rodent offspring exposed to low-protein maternal diet, Morimoto *et al*. demonstrated that aging-associated glucose-stimulated insulin secretion was affected by maternal diet. These findings indicate that age-related development of diabetes may be programmed by nutritional exposure *in utero* and/or during lactation.

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