

In This Issue

This second Issue of *Journal of Developmental Origins of Health and Disease* contains two invited Reviews, the first discussing the impact of the periconceptual environment on fetal programming, and the second assessing genetic influences on the association between fetal growth and Type II diabetes. The Original Articles include human and epidemiologic studies, and investigations of vascular function in rodents.

Impact of the periconceptual environment on the programming of adult disease: In this first Review, Watkins *et al.* examine the role of the periconceptual environment as a critical developmental window which may influence fetal programming. Studies in experimental animal models, domestic animal production, and human assisted reproduction demonstrate the potential for local hormonal and nutrient factors to alter gene expression in the ovary, oocyte, blastocyst, and developing sperm. The authors elucidate the role of epigenetic modifications in the regulation of periconceptual gene expression.

Genetic influences on the association between fetal growth and susceptibility to Type II diabetes: This Review by Shields *et al.* postulates that both low birth weight and susceptibility to Type II diabetes may be phenotypes of insulin resistance and β -cell dysfunction, with the former occurring in utero and the second during adulthood. The authors present a compelling case for genetic influences on both fetal growth and the predisposition to Type II diabetes. Utilizing evidence of monogenic disorders, epidemiologic studies, and genome wide studies, the authors support the premise that select genetic variance may predispose to a common insulin resistance phenotype.

Agreement between self-reported birth weight and birth certificate weights: In the first Original Article, Jaworowicz *et al.* examine the accuracy of patient recall for self-reported birth weight. Although birth certificate weight data was significantly correlated with self-reported birth weight, the correspondence was viewed as fair to moderate. This study emphasizes that appropriate reporting of birth weight is critical to our understanding of the role of early life exposures in relation to chronic disease in adulthood.

Size at birth is associated with blood pressure but not insulin resistance in 6–8 year old children in rural Nepal: Stewart *et al.* examine the association between birth weight and systolic/diastolic blood pressure among offspring at six to eight years of age. In this population with a high prevalence of undernutrition, size at birth was inversely associated with childhood blood pressure and triglycerides, and positively associated with waist circumference. These studies further support the association of rapid weight gain following birth in low birth weight infants to be associated with elevated blood pressure.

Birthweights smaller or larger than the placenta predict BMI and blood pressure at age seven years: In this study by Misra *et al.*, the authors hypothesize that altered placental growth, which is recognized to influence birthweight, may further affect childhood body proportions and vascular function, independent of birthweight itself. The authors utilized a subset of the national collaborative perinatal project which included nearly 16,000 cases. The results indicated that variation in birth weight to placental size had a significant effect on BMI at seven years of age. These findings suggest that the placental role in fetal programming, perhaps by nutrient supply or fetal endocrine exposure, may have a significant role in the prediction of adult disease.

Maternal copper deficiency perpetuates altered vascular function in Sprague-Dawley rat offspring: Anderson and Johnson utilized copper deficient rat dams to examine offspring vascular function in both first and second generation offspring. In F1 offspring of copper deficient dams, there was increased vascular responsiveness to potassium chloride in males, and enhanced endothelium dependent relaxation responses in females. Importantly, altered vascular endothelium independent and dependent relaxation responses were observed in F2 second generation males. These studies highlight the critical impact of micronutrient deficiencies, with potential long term generational effects.

Michael G. Ross, M.D., M.P.H.
Editor-In-Chief
DOHaDEditor@cambridge.org