

In This Issue

This issue of *Journal of Developmental Origins of Health and Disease* contains a themed issue 'Advancing the DOHaD Agenda in Africa,' comprising six papers that address elements of the DOHaD agenda in Africa. As noted in the editorial by our Guest Editors (Daar, Norris, Pauw, Macnab), Africa faces enormous health burdens of both infectious and noncommunicable diseases, which mandate a shift from treatment to prevention. The editorial and original articles highlight several of the most critical aspects of African health on DOHaD-related issues, including HIV infection, depression and anxiety, infant feeding practices, childhood health, and pregnancy.

In addition to the Africa-themed issue, this issue of J DOHaD contains six additional Original Articles and one Brief Report encompassing both animal models and human studies.

Brief Report

Responsibility in the age of Developmental Origins of Health and Disease (DOHaD) and epigenetics. Ismaili M'hamdi *et al.* present two initiatives that empower mothers-to-be to take responsibility for their own and their own children's health. The authors focus on an ethical framework to determine social responsibility to address health inequalities, as compared with individual responsibility for health, as related to DOHaD and epigenetic mechanisms. The combination of individual and social responsibilities for addressing health inequalities may be the optimal pathway for assuring health of the subsequent generation.

Original Articles

Exercise during pregnancy and its impact on mothers and offspring in humans and mice. Ferrari *et al.* compared the long-term effects of exercise on body composition and metabolism in pregnant women and mice, demonstrating a significant impact of exercise on human fat content and leptin levels, findings which were not observed in mice. In contrast, offspring weight gain results were similar in humans and mice, though there were varying effects in insulin and leptin. In all, this study demonstrates positive short-term and long-term effects of pregnancy exercise on both mother and offspring in mice and humans, though important differences in responses among the species.

Diabetes in pregnancy in Wistar rats: renal effects for mothers in the postpartum period. França-Silva *et al.* utilized a diabetic rat model (alloxan) to examine maternal renal effects. Diabetes induced during pregnancy resulted in significant renal structural and functional changes in mothers, including cortical hypertrophy and reduced glomerular filtration rate. The finding that these changes may be mediated in part by the MAPK cascade provides potential therapeutic strategies for future studies.

The RPMI-1640 vitamin mixture promotes bovine blastocysts development *in vitro* and downregulates gene expression of *TXNIP* with epigenetic modification of associated histones. Ikeda utilized a mixture of B-vitamins in bovine *in vitro* fertilization embryos to assess effects on preimplantation stress (*TXNIP*). Vitamin treatment significantly increased rates of blastocyst development and reduced messenger RNA expression of *TXNIP*, in conjunction with increased histone methylation of the *TXNIP* promoter. These findings suggest that epigenetic control of genes during the peri-conceptual period by nutrient factors, including B-vitamins, may have important impact on developmental programming.

Relationship between physical activity and physical performance in later life in different birth weight groups. Jantunen *et al.* examined 695 individuals born between 1934 and 1944 from the Helsinki birth cohort. Activity and physical performance was assessed in association with participants' birth weight. There was a significant association between the level of physical activity as well as physical performance in men with low birth weight (<3000 g) suggesting that men with low birth weight may benefit most from engaging in physical activity in order to maintain better physical performance in later life.

Sleep patterning changes in a prenatal stress model of depression. Sickmann *et al.* utilized a model of rats exposed to prenatal stress to examine effects on offspring sleep/wakefulness behavior. Both REM sleep and slow wave sleep were increased in offspring of prenatal stress rats with the increase in REM due to an increase in bout number rather than bout duration. These findings indicate that prenatal stress alters sleep patterning in both male and female rat offspring following weaning. As sleep changes are a hallmark of depression and are associated with other important health measures, these findings raise important issues for reduction of stress throughout the pregnancy period.

Preserved heart function after left ventricular pressure overload in adult mice subjected to neonatal cardiac hypoplasia. Heinecke *et al.* utilized a mouse model of impaired myocardial development, which results in a 25% reduction in cardiomyocyte number, to investigate the physiologic response of hypoplastic hearts to pressure overload in adulthood. In response to chronic increase in left ventricular pressure, offspring with cardiac hypoplasia shows an improved functional outcome compared with controls. These findings suggest that developmental programming associated with intrauterine growth restriction can be beneficial under certain conditions, similar to other findings of predictive–adaptive responses.

Michael G. Ross M.D., M.P.H.

Editor-In-Chief

Journal of Developmental Origins of Health and Disease (J DOHaD)