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In This Issue

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This issue of Journal of Developmental Origins of Health and Disease has two superb reviews and 13 original articles. Several of the manuscripts emphasize the intergeneration etiology of obesity and metabolic syndrome.

Review articles

The goal of maternal diet on offspring hyperinsulinemia and adiposity after birth: A systematic review of randomized controlled trials. North et al reviewed 14 qualifying reports which together demonstrated no specific effect of maternal diet on neonatal cord blood insulin, c-peptide or glucose levels. However, interventions that provided nutrition counseling to women with obesity or prior macrosomic infants were associated with lower infant adiposity. The authors conclude that lifestyle-based dietary interventions have a protective effect against excess infant adiposity.

Maternal BMI: Breastfeeding and perinatal factors that influence early childhood growth trajectories: A scoping review. Del Castillo and co-authors examine the relationship between maternal BMI and breastfeeding on childhood growth trajectories. The authors confirm that early-life risk factors for childhood obesity are multifactorial and potentially modifiable, and suggest early preventative interventions (eg, exclusive breastfeeding to six months and healthy lifestyle behaviors).

Original articles

Supplemental folic acid and/or multivitamins in pregnancy is associated with a decreased risk of childhood and adolescent nasopharyngeal carcinoma. Yan and colleagues examined a group of patients with childhood and adolescent nasopharyngeal carcinoma as compared to a control population. The maternal use of folic acid and/or multivitamins during pregnancy was associated with a significantly reduced risk of childhood and adolescent nasopharyngeal carcinoma. The authors suggest that protective mechanisms of folic acid may include epigenetic modification processes, though further independent validation of the findings is warranted.

DNA methylation mediates a randomized control trial home-visiting intervention during pregnancy and the Bayley infant's cognitive scores at 12 months of age. Euclydes et al analyzed cord blood DNA methylation from low-income Brazilian pregnant adolescents. The statistical analysis indicated that the effect of home-visiting intervention on infant cognitive outcome may be mediated by genome methylation differences.

Sex-specific associations between in utero exposure to persistent organic pollutants and allergy-related outcomes in childhood: The Rhea Mother-Child cohort. Margetaki and co-authors assessed the association of prenatal exposure to persistent organic pollutants (POP) and offspring allergic outcomes. Prenatal POP exposure was associated with increased risk of rhino-conjunctivitis, asthma and eczema in a sex- and age-specific manner.

Maternal high-fat diet consumption programs male offspring to mitigate complications in liver regeneration. Fante et al examine the liver regeneration capacity in offspring of high-fat diet fed obese dams after partial hepatectomy. Although increased adiposity and fatty liver were observed in offspring of obese dams, there was no difference in survival rate after partial hepatectomy of offspring exposed to high-fat diet during perinatal period. The authors suggest that offspring of obese dams are programmed to be protected from the damage promoted by high-fat diet.

Childhood eating practices are relevant to ultra-processed food consumption in adulthood: Results from the Nutritionists' Health Study. Penha and co-authors performed a cross-sectional analysis of nutrition undergraduate students or nutritionists assessing current food consumption and childhood eating practices. The results suggest that childhood feeding practices including fruit and vegetable intake, exclusive breastfeeding and introduction of infant formula were linked to food consumption in adult life.

Reproductive fluids, added to the culture media, contribute to minimizing phenotypical differences between in vitro-derived and artificial insemination-derived piglets. Paris-Oller et al compared blood samples and growth parameters from piglets derived from in vitro-produced embryos versus artificially inseminated offspring. The authors demonstrated that the addition of reproductive fluids (follicular, oviductal and uterine) contributed to minimizing phenotypical difference between the larger offspring derived from in vitro fertilization, particularly in males.

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Is increased size at birth associated with longevity on the population level? A historical and comparative analysis of regions in Sweden. Quaranta and co-authors examine Swedish population data from 1936-1938 and 1935-1945. The authors demonstrated that being low birth weight, small for gestational age or short birth length, reduced survival. The authors suggest that favorable early life conditions may contribute to higher life expectancy and lower rates of cardiovascular disease mortality.

Early postnatal exposure of rat pups to methylglyoxal induces oxidative stress, inflammation and dysmetabolism in adulthood. Francisco exposed newborn rats to methylglyoxal (MG) during the first two weeks of lactation. As compared to controls, early postnatal MG exposure induced inflammation and fibrosis markers in pancreas, liver and kidney, with associated metabolic dysfunction features including increased food intake and insulin resistance. The authors emphasize that MG levels, which are associated with processed food exposure, should be limited during the early postnatal period.

Propensity score analysis of the association between maternal exposure to second-hand tobacco smoke and birth defects in northwestern China. Li and co-authors examine the effect of second-hand smoke (SHS) on birth defects. The overall risk of birth defects demonstrated an increasing trend with the frequency of exposure to SHS, particularly with defects of the circulatory system.

Exposure to maternal hyperglycemia and high-fat diet consumption after weaning in rats: Repercussions on periovarian adipose tissue. Saullo et al examine the effect of high-fat diet exposure from weaning to adult life in offspring of maternal diabetic rats. High-fat diet following weaning resulted in higher body weight, body fat and increased periovarian fat in adult offspring. The authors emphasize the impact on intergenerational effects of diabetes which may be exacerbated by high-fat post weaning diet.

Maternal intake of fructose or artificial sweetener during pregnancy and lactation has persistent effects on metabolic and reproductive health of dams post-weaning. Bridge-Comer and colleagues exposed mice to fructose or artificial sweetener (AS) throughout pregnancy and lactation. At eight weeks' postpartum, glucose intolerance was evident in both AS- and fructose-exposed dams, and adipocyte size was increased. The authors conclude that AS may not represent a beneficial substitute for fructose during pregnancy, as both may contribute to the increased risk of later life diabetes.

Relation of maternal birth weight with early pregnancy obesity, gestational diabetes, and offspring macrosomia. Johnsson and co-authors examined Swedish databases for the association of maternal birth weight, early pregnancy obesity, gestational diabetes mellitus (GDM) and offspring birth weight. Higher maternal birth weights were associated with greater odds of early-pregnancy obesity while low maternal birth weight was associated with greater odds of GDM. As a high maternal birth weight was associated with an increased likelihood of adult overweight and obesity as well as offspring macrosomia, these findings indicate the intergenerational impact of high birth weight.

Childhood waist growth curves and adult diabetes. Carli and colleagues utilized the Fels longitudinal study to assign childhood groups based on waist size measurements. Childhood groups are distinguishable at ages as early as 4 years and growth curves exhibited by those with the highest waist size are associated with increased risk for hypertension and type 2 diabetes mellitus.

Respectfully,

Michael G. Ross, MD, MPH
Editor-in-Chief

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