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In This Issue

This issue of the *Journal of Developmental Origins of Health and Disease* contains two review articles that focus on topics of gut microbiota and preterm feeding and growth. The original articles include human studies assessing postnatal thymic size and primary school performance, one animal study examining the mechanism of programmed obesity in growth-restricted offspring, and two studies focusing on placental pathology in patients with preterm PROM and gestational diabetes, respectively.

Reviews

The role of gut microbiota in programming the immune phenotype. Weng and Walker present a review of the increasingly important concept of gut microbiota. The authors review the process by which initial bacterial colonization occurs in response to a vaginal delivery and the differences that occur in response in an infant delivered by Cesarean section. The colonization and interaction with gastrointestinal lymphoid tissue results in an immune homeostasis, whereas inadequate intestinal colonization may result in an increased incidence of immune-mediated diseases. The authors discuss the potential role of probiotics in normalizing intestinal colonization in preterm infants or those delivered by Cesarean section.

Optimum feeding and growth in preterm neonates. Harding and colleagues review the challenging issue of optimum feeding and growth in neonates born preterm. Supplements of macro- or micronutrients have potential short-term risk and benefits for the preterm infant. Whereas a rapid catch-up growth among low-birth-weight offspring may result in improved neurologic outcome. It may predispose to increased cardiovascular risk in later life.

Original Articles

Disproportionate early fetal growth predicts postnatal thymic size in humans. Fulford and colleagues measured the growth of select fetal parameters in Bangladeshi women at 14, 19 and 30 weeks of pregnancy, calculating the thymic index and subsequently calculated the thymic index in offspring through one year of age. Fetuses with evidence of head-sparing growth restriction were more likely to have a lower thymic index during infancy. The authors conclude that growth patterns suggestive of fetal undernutrition may be predictive of poor thymic development.

Association of perinatal factors and school performance in primary school Chilean children. Villarroel and colleagues assessed the association between prenatal growth and primary school cognitive function, as measured by language and mathematic test scores. Although the biologic variables of birth length and birth weight were positively correlated with language and mathematic test results, each week increase prolonged gestational age to the range of 37–41 weeks was associated with a reduction in test scores. Socio-economic confounders had a significant impact on language and mathematics outcome, particularly the effect of private *v.* public school. Although the authors conclude that maternal and fetal undernutrition may have long-term implications on cognitive development, the findings underscore the critical effects of socio-economic status.

Mechanism of programmed obesity: altered central insulin sensitivity in growth-restricted juvenile female rats. Fukami and colleagues utilized a growth-restricted rat model to investigate the mechanism by which appetite-mediated rapid catch-up growth occurs. The authors examine the anorexigenic and signaling effects of central insulin in intrauterine growth restricted (IUGR) and control offspring. Despite feeding, IUGR offspring were relatively resistant to anorexigenic effects of central and exhibited persistent orexigenic stimulations in the arcuate nucleus. These results provide insight into mechanisms that contribute to programmed hyperphagia and obesity.

Patterns of placental pathology in preterm premature rupture of membranes. Armstrong-Wells and colleagues histologically examined placentas from pregnancies complicated by preterm premature rupture of membranes (PROM) at altitude (Denver, CO, USA). The authors found evidence of histologic acute chorioamnionitis in 59% of placentas with slightly lower rates of funisitis. Importantly, subchorionic thrombi were observed in 34% of placentas, with the risk of thrombi increased in those placentas without chorioamnionitis. These findings indicate that preterm PROM may involve mechanisms of both inflammation and/or thrombosis.

Reduced apoptosis in term placentas from gestational diabetic pregnancies. Belkacemi and colleagues examined a

sampling of placentas from control and gestational diabetes mellitus (GDM) patients. Expectedly, both neonatal birth weight and placental weight were higher in the GDM group. The authors found that the apoptotic index of placentas and apoptotic markers were significantly decreased in GDM placentas, suggesting that reduced apoptosis may contribute to increased placenta tissue and perhaps fetal macrosomia.

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