Prenatal and postnatal nutrition: impact on child health

Berthold Koletzko[a] *and Ranan Shamir*[b]

The articles in this paediatric section address nutrition and metabolism during prenatal and postnatal life and their impact on child health. Four articles focus on metabolism and lifestyle during pregnancy and their effects on fetal growth and offspring health. Larqué *et al.* (pp. 292–297) review present information on the role of the placental transport systems in regulating maternofetal transfer of glucose mediated by the family of glucose transporters, of fatty acids by fatty acid binding and transport proteins, and of cholesterol by lipoprotein receptors and carrier proteins. The possible effects of maternal diabetes and opportunities for future research approaches are highlighted. Sferruzzi-Perri *et al.* (pp. 298–309) discuss the hormonal regulation of fetal growth and its interaction with nutrient supply and describe the key anabolic roles of insulin and of insulin-like growth factors I and II, and the additional importance of thyroid hormones in supporting fetal growth. Fetal hormonal response to restricted intrauterine nutrient and oxygen availability modulates adaptation of fetal growth, which apparently serves to optimise fetal survival under such adverse conditions. Cetin *et al.* (pp. 310–319) examine nutritional and environmental factors predisposing to intrauterine growth restriction (IUGR), which is linked to a variety of adverse child outcomes. Interestingly, both maternal undernutrition and maternal obesity lead to an increased risk of IUGR. Exposure to alcohol, tobacco and some environmental pollutants in pregnancy increases the risk of IUGR, with first indications that epigenetic mechanisms may mediate these effects. Entringer (pp. 320–327) discusses exciting new concepts and findings linking maternal prenatal psychosocial stress to endocrine and immune effects as well as programming of adverse heath outcomes, including altered metabolic response, body fat accumulation and obesity. She suggests that systematic studies on the effects of prenatal stress on offspring disease risk should be performed that address underlying mechanisms and hence should encompass experimental, molecular and cellular studies.

The topics of three further manuscripts focus on nutrition after birth. Kurpad *et al.* (pp. 328–338) provide an impressive report on the high prevalence of micronutrient deficiencies in children and their huge significance for growth, health, motor and cognitive performance and morbidity. The authors emphasize that there is considerable heterogeneity among the available interventions studies, and that effects of micronutrient administration will likely vary with dosage and timing of the intervention, which requires further systematic work. Mehedint and Zeisel (pp. 339–345) address the multiple roles of choline in human metabolism and focus on the adverse effects of low choline supply on hepatic integrity and function, with an apparent higher likelihood of occurrence in individuals that carry one of several very common genetic polymorphisms in genes of choline metabolism. They suggest that dietary choline intake is an important modifier of epigenetic marks on DNA and histones, and thereby modulates gene expression in many of the pathways involved in liver function and dysfunction. Szajewska (pp. 346–350) reviews recent evidence challenging earlier conclusions and recommendation on dietary approaches to allergy prevention in childhood. She concludes that studies on effects of exclusive breastfeeding for 6 months reveal inconsistent results with regards to modification of allergy risks. In infants with a family history of allergy that are not fully breastfed, the use of infant formula with confirmed reduced allergenicity (based on protein hydrolysates) during the first months of life is recommended, while there is no evidence for any benefit of delayed introduction of potentially allergenic complementary foods beyond 4–6 months of age. The early supply of n-3 long-chain polyunsaturated fatty acids may contribute to

[a]Dr von Hauner Children's Hospital, University of Munich Medical Centre, München, Germany and [b]Schneider Children's Medical Centre, Sackler Faculty of Medicine, Tel-Aviv University, Israel

Correspondence to Berthold Koletzko, Dr von Hauner Children's Hospital, University of Munich Medical Centre, München, Germany. Tel: +49 89 5160 2826; fax: +49 89 5160 7742; e-mail: office.Koletzko@med.uni-muenchen.de

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preventing childhood allergy. Observational data associate the intake of vitamins A, D and E, zinc fruit and vegetables and a Mediterranean diet with a reduced atopic disease.

Together, these excellent reviews indicate the very powerful effects of the early diet in modulating long-term body function, health and well-being. Therefore, major investments in research that strengthens our understanding of such effects and of underlying mechanisms as well as major investments in sustainable improvement of practice seem very important and timely.

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Conflicts of interest

There are no conflicts of interest.