Editorial

Knowing the nutritional needs of the fetus is key to provide guidelines how to feed infants who are born with very low or low birth weight (LBW) [1]. Immediately after birth, the supply of all necessary nutrients which are essential for growth and development is interrupted. As a result, adequate nutrient supply through parenteral and enteral nutrition from the first day of life onwards is fundamental to avoid short- and long-term negative effects on health outcome. Postnatal growth restriction due to inadequate nutrient supply is associated with impaired neurological and cognitive development. Recently, a causal relationship between low protein and energy intake during the first week of life and impaired cognitive development at 2 years of age has been demonstrated. Therefore, it is important to have detailed knowledge on the requirements of energy and key nutrients such as protein, Ca, P, Mg, Na, K, and Cl. The requirements, which were calculated by Ziegler [2] by employing both factorial and empirical approaches, are the basis for adequate human milk fortifiers or formulas specially designed for that target group.

The cause of growth restriction in LBW infants after birth is multifactorial, but approximately 50% of the variance in early postnatal growth can be attributed to nutrition. It is thus necessary to know all important aspects to optimize nutritional intake during the first weeks of life. Among those are a proper infrastructure, early initiation of parenteral nutrition, transition to fortified breast milk, or preterm infant formula, and monitoring nutritional tolerance [3]. After discharge from the hospital, LBW infants still have specific nutritional needs; recommendations to continue feeding of fortified human milk or a nutrient-enriched formula need to be considered. Close monitoring of growth is most important, because both

low growth and rapid ‘catch-up’ growth are associated with later adverse health outcomes [4]. LBW infants receiving supplementation of infant formula with long-chain polyunsaturated fatty acids, particularly docosahexaenoic acid, have consistently shown better visual and neurological development. The question of how much docosahexaenoic acid is needed is still controversial [5]. The most recent publications and meta-analyses on the prevention of necrotizing enterocolitis by giving certain probiotic strains to non-breast-fed LBW infants are the first to indicate that ‘good bacteria’ can help to reduce morbidity and mortality.

What are the future research needs? One major focus should be on the prevention of LBW. Out of the 134 million newborns worldwide in 2008, 15.5% had birth weights less than 2,500 g, and the mean percentages in most industrialized and developing countries are 7 and 16%, respectively. However, in a cluster of 5 countries – India, Bangladesh, Nepal, Philippines, and Ethiopia – 26% (mean) of newborns have LBW. The causes were poorly researched in the past; only recently have we started to understand the negative influence of poor quantitative and qualitative maternal nutrition on the birth weight of infants. Maternal folic acid and vitamin B12 deficiency states can play a role. Inadequate nutrition during the different stages of pregnancy can induce epigenetic phenomena, which negatively affect long-term outcome. In emerging countries, evidence-based research to define the nutritional needs during pregnancy and implementation of public health policies are urgently needed. This will help to save millions of infants from the negative short- and long-term consequences of being LBW.

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References

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