

Postnatal growth restriction and individualized fortification

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Breast milk is considered as the most appropriate nutrition for very immature preterm infants. However, “mother nature” designed the composition of breastmilk to meet needs of term infants during their first six months of life. Preterm infants have significantly higher growth rates compared to term infants and therefore enhanced nutritional needs. Current concepts to adapt human milk to their needs are based on average values of breastmilk composition. They do not take into account that breastmilk composition is subject to significant intra- and inter-individual variation. This variation puts a significant percentage of infants at risk for postnatal growth retardation and literature reports that more than 50 % of human milk fed preterm infants are affected. The consequences of postnatal growth retardation might be equally concerning as those caused by intrauterine retardation due to placental insufficiency. Besides long-term effects on metabolism (diabetes, hypertension, body composition etc.) neurodevelopmental consequences are of concern. Target fortification has been shown to reduce the number of infants with inappropriate growth patterns. It requires precise and fast measurement of breast milk composition, ideally at bedside. We recently evaluated milk analysers and proposed correction algorithms to improve their accuracy. We could also show that it might be beneficial to measure all three macronutrients instead of protein alone. The carbohydrate-to-fat ratio seems to be important for appropriate growth and to achieve a healthy body composition. We recently showed that the levels of macronutrients do not correlate, and therefore need to be measured to perform adequate fortification.

Target fortification increases work load in the NICU, but will be beneficial if better growth rates can be achieved. We will propose the scientific basis for a measurement schedule with two measurements per week as the best cost-benefit approach.

References

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