Letter to the Editor

Influence of Protein Intake During Complementary Feeding on Body Size and IGF-I Levels in 12-Months-Old Infants

Ţincu et al. Protein Intake During Complementary Feeding

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Our understanding of postnatal growth and later influence on childhood obesity in relation with early nutrition is revealed by growing evidence worldwide. Early dietary risk factors should be taken under consideration in order to prevent later obesity (1). Few epidemiological trials have investigated the role of weaning period protein intake in stimulating endocrine and metabolic mechanisms that can furthermore lead to rapid weight gain and adiposity in children. This paper examines whether protein intake from complementary feeding is associated with IGF-I levels and greater growth rates in children of 1 year of age.
The eligible population was formed of healthy term infants examined at their check–up visits at 6 and 12 months. Out of the 127 families of infants invited to participate, only 75 (85%) completed the 1 years follow up period. All participants were assessed with anthropometry, 3 days food record and blood analysis of IGF-I at the age of 1 year.
The distribution according to Z-score for weight-for-length in terms of underweight, normal weight, overweight/obese children were 11.5%, 74.3% and 14.2% respectively, at 12 months old. Girls had considerable higher values for IGF-I than boys (78.3 [51.3; 114.2]) vs 72.5 [49.3;92.1]. There was a progressive trend of decreasing partial or fully breastfeeding according to age, with 55% of infants being breastfed for 4 months. There was a median of protein intake of 3.4 g/kg of body weight, ranging between 1.1 and 5.2 g/kg body weight. Daily protein intake at 12 month was positively correlated with body size in terms of weight and length ($p<0.0001$). Protein intake was significantly correlated with serum urea and IGF-I. We calculated the determination coefficient in order to analyse the effect of protein intake upon IGF-1 level, meaning R^2 =70.5%. The infants receiving <2.5g protein/kg of body weight had median values for IGF-I with 35% lower than the ones receiving higher amounts. Serum concentration of urea and glucose were also significant higher in infants fed with higher amount of protein in their diet (Table 1). Also, subjects being breastfed for 6 months had lower values for IGF-I at the age of 12 months than those receiving formula (76.6 ng/ml [52.8; 113.5] and 71.3ng/ml [48.1;89.3], $p<0.05$).
This is the first analysis of quantitative diet received by Romanian infants, although descriptive data have been reported in a previous investigation (2). Rolland-Cachera et al were the first introducing the early protein hypothesis stating that high protein intake in early infancy induces obesity risk later in life (3). The protein content of the diet infants were offered was quite high compared to normal ranges ($\bar{x}$: 15% of energy; 90th percentile: 19% of energy); some other studies report data about protein intake in late infancy of 16.3% (3) and 20% of energy (4). The larger amount of daily protein intake the infants were offered, the bigger their weight and length was at the age of 12 months.
The introduction of solid food in children diet offers increasing amount of protein, sometimes exceeding real needs. Further studies on extended population are needed in order to provide sustained evidence about the impact of protein amount during complementary growth rates in childhood.

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Table 1. Variation of IGF-I, urea and glucose levels according to protein intake[a]

Measured variable	Low protein	High protein	P-value
IGF-I (ng/dl)	70.6 (49.9,88.5)	78.3 (56.2, 110.8)	<0.001
Urea (mg/dl)	19 (15, 22)	28 (21, 35)	<0.001
Glucose (mg/dl)	88 (78, 97)	94 (76, 98)	<0.05

[a]median values and interquartile ranges in parenthesis.