Commentary


The Challenges of Promoting Optimal Infant Growth

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Safe and adequate complementary feeding of breastfed infants is well recognized as a critical factor in preventing child malnutrition. In disadvantaged populations, growth faltering is most evident in the first year of life, and is often accompanied by micronutrient deficiencies and high rates of infection. After two years of age, it is very difficult to reverse the growth stunting that has occurred earlier. Thus, it is essential to identify interventions that are effective in promoting optimal growth and development in early life.

Several recent documents have prompted greater attention to complementary feeding (1–3), and there is intense interest among policy makers in implementing effective programs. Unfortunately, there have been very few well-designed intervention trials to evaluate the efficacy and effectiveness of various strategies for improving complementary feeding. As a result, the scientific base for advising policy makers is much thinner than desirable. The few studies available indicate that it is certainly possible to improve feeding practices, but the impact on growth and other functional outcomes has been mixed. For example, among 10 efficacy trials in which an enhanced or fortified complementary food was provided free of charge to infants of various ages, only three demonstrated an increase in linear growth (3). There are many possible reasons for the lack of impact in the other trials, such as targeting the intervention too early (e.g., before 6 mo) or too late (e.g., after 12 mo); methodological limitations such as small sample size, short duration of the intervention, or attrition bias; and constraints on growth response due to infections, prenatal “programming” or other factors.

In this context, the intervention study conducted by Bhandari et al. (4) in an urban slum in India makes an especially important contribution. The researchers used a strong experimental design: a randomized controlled trial that evaluated the effects of providing a micronutrient-fortified complementary food (with nutritional counseling) or nutritional counseling alone on infant complementary food intake, growth and morbidity between 4 and 12 mo of age. They included two different control groups: one that received the same number of home visits as the two intervention groups (twice weekly), and one that was visited only three times for measurements. The former group (“visitation group”) was defined a priori as the most relevant control group for data analysis. Strengths of the study include a relatively generous sample size (>100 infants per group), reasonably low attrition rates, documentation of use of the fortified food, and careful frequent assessments of growth and morbidity. In the food supplementation group, packets of the fortified food were delivered to the home twice a week and the mother was instructed to mix the instant powder with boiled water.

The researchers report a modest increase in weight gain (250 g over 8 mo) in the food supplementation group, but no significant effect on length gain, and no growth impact of nutritional counseling alone. The weight gain difference in the food supplementation group was almost entirely attributable to differences between 6 and 9 mo, with no significant difference among groups in the earlier (4 to 6 mo) or later (9 to 12 mo) age intervals. Compared to expected growth rates of breastfed infants at these ages (5), weight and length gain of these Indian infants was normal between 4 and 6 mo, but fell below normal subsequently. The overall average “deficit” in weight gain between 4 and 12 mo was about 800 g in the control group. Thus, the fortified food resulted in making up about a third of this deficit.

The effects of food supplementation on breastfeeding, as well as some of the morbidity outcomes, were disconcerting. In the food supplementation group, breastfeeding frequency was significantly lower at 6 and 9 mo (by 1–2 feeds per day), and fewer infants were still being breastfed at 12 mo in comparison with the visitation group (84 vs 97%). Despite the advice to use boiled water, the prevalence rate of dysentery was twice as high in the food supplementation group and the prevalence of fever was increased by 44%. The authors speculate that the relatively small effect on weight gain, and the lack of impact on length gain, could be partially due to the adverse effects of this intervention on breastfeeding and morbidity.

What are the lessons to be learned from this study? The authors conclude that the infants’ energy intake from complementary foods may still have been lower than desirable, even in the food supplementation group, and suggest that there are barriers related to the amount of food offered by caregivers that need to be overcome. While this may be part of the explanation, there are other potential constraints on intake and growth that may be at least as important. First, restrictions on infant appetite due to micronutrient deficiencies or illness may play a major role. It is well known that zinc deficiency depresses appetite, and the same may be true for other nutrient deficiencies. Although the fortified food provided a reasonable amount of zinc compared to estimated needs at this age (1), its bioavailability is uncertain. In the nutrition counseling group, the emphasis appears to have been on feeding frequency, portion size and energy density of complementary foods, rather than on micronutrient density. Moreover, in both interven-

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2 Abbreviations: IUGR, intrauterine growth retardation.

that the growth rates of these infants at 4–6 mo were at or near expected values for breastfed infants (5), suggest that near-exclusive breastfeeding for six months is compatible with normal growth even in a population in which maternal malnutrition is prevalent.

In conclusion, the results of the intervention trial reported by Bhandari et al. illustrate the need to better understand the etiology of infant growth faltering. In particular, researchers and program planners need to pay special attention to the potential impact of complementary food interventions on rates of breastfeeding and the prevalence of illness, and not assume that merely increasing complementary food intake will have the desired impact. This is one situation in which “more” is not necessarily “better,” because of the tradeoff between intake of complementary foods and intake of breast milk. In fact, the infants in the food supplementation group actually consumed the recommended numbers of food packets per day, while those in the breastfed infants group would have met their total energy needs from the fortified food alone, leaving no room for energy from breast milk. Planners sometimes justify providing more than needed, to allow for individual variability and the possibility of catch-up growth, but in so doing they must recognize that there are risks associated with “overshooting.” Comprehensive approaches that address the full range of prenatal and postnatal influences on growth are needed to reduce the rates of stunting in malnourished populations.

LITERATURE CITED