Editorial

Strategies for the Prevention of Iron Deficiency Anaemia in Children

As a result of accumulating evidence about the benefits of exclusive breastfeeding, the World Health Organization issued a statement recommending exclusive breastfeeding for 6 months [1]. This document advised that further studies are needed for assessment of the risk of micronutrient deficiencies, especially in susceptible infants. These infants include those living in areas where iron, zinc and vitamin A deficiencies are prevalent. Upon this word of caution and with recommendations that iron supplementation be started at 4–6 months of age in breastfed infants [2], such supplementation has been started in some developing countries such as Turkey and Brazil [3]. However current evidence regarding the actual need for this supplementation is inadequate.

Iron deficiency anaemia (IDA) is identified as an important public health problem especially during early childhood in developing countries. Body iron stores at birth are determined by many factors, among which maternal anemia, low birth weight, prematurity and early cord clamping are of foremost importance [4]. Breast milk iron content has been shown to be independent of maternal iron status, but fetal growth and newborn iron stores correlate with maternal iron stores [5]. Regardless of environmental risk factors, infants of anemic mothers appear to be at increased risk of developing IDA, undetected at birth [6]. Poor fetal growth per se is also associated with maternal nutritional status and the increased prevalence of iron deficiency in infants from developing countries may partially be attributed to catch-up growth in the first 4 months of life. Hence, for prevention of IDA in early life, priority should be given to improve the nutritional status of all women in the society, to increase the availability of antenatal care and to recommend iron supplementation to pregnant women.

An experimental study showed that at 9 months of age, iron absorption from human milk remained low in iron-supplemented infants but was higher in un-supplemented group and the authors concluded that changes in the regulation of iron absorption between 6 and 9 months increase the breast-fed infant’s ability to adapt to a low-iron diet and yield a mechanism by which some infants avoid iron deficiency despite low iron intakes in late infancy [7]. These results indicate that iron supplementation during this stage of life may hamper this mechanism.

Studies on the effectiveness of iron supplementation among exclusively breast-fed 4–6 month-old infants are scarce and the results are controversial. In a randomized, double-blind clinical trial, full-term 6-month-old infants were assigned to receive a standard dose of multivitamins with or without added iron (10 mg/day) [8]. No difference was found in the occurrence of anaemia and of iron deficiency at 9 months of age between the two groups. On the other hand, infants whose mothers were anemic were more likely to be anemic than others at 9 months of age. Similar findings were reported in a small study in which exclusively breast-fed 4-month-old infants were assigned to three groups, the first group receiving daily (1 mg/kg daily), the second group weekly (7 mg/kg weekly) iron supplementation and the third group receiving no supplementation. Hematologic parameters were similar among the three groups at 7 months of age. Maternal anemia was found to be the only significant factor affecting these parameters [9]. In a recent study on infants aged 8–20 months, prophylactic iron supplementation which was continued after the anaemia was resolved, showed no advantage over placebo at 12 months post-supplementation for most infants [10]. In a randomized, double blind, placebo-controlled clinical trial of iron supplementation among exclusively breast-fed infants, no advantage was seen at 9 months in initiating supplementation at 4 months over initiation at 6 months [11]. Supplementation given from 6–9 months significantly reduces the risk of IDA in a population with a high prevalence but not in one with low prevalence of IDA. It has been reported that iron supplementation in populations where IDA is uncommon is not beneficial and may even be harmful, particularly if started prior to 6 months, by leading to poor linear growth, poor weight gain and increase in diarrheal diseases [12, 13]. Therefore safety, as well as efficacy should be considered in relation to iron supplementation to infants and children who are not iron deficient. There is concern that in adults, high iron stores may be more
disadvantageous than iron deficiency [14]. The relevance of these findings to very young children is uncertain. On the other hand, iron supplementation in infants younger than 6 months can be deleterious for exclusive breastfeeding activities because it may undermine the value of breastfeeding and can lower the self-confidence of mothers.

Resources are limited, especially in developing countries. Therefore, priorities should be clearly identified and all new strategies need to be protective and supportive of other related strategies.

Delayed introduction of high quality complementary foods and feeding inappropriately small amounts of these foods also contribute to the development of IDA in children from developing countries [15]. These inadequate weaning practices may be a result of a combination of factors including lack of knowledge, cultural misbeliefs and inadequate access to nutrient-dense foods. In a community based randomized trial by Kapur, et al., the cohort included infants and children between 9 and 36 months of age and their mothers who were assigned to one of the following groups: Group 1 consisted of mother-infant pairs, with mothers receiving nutrition education. In Group 2, supplementation was given to the infants (20 mg elemental iron/week). Group 3 received nutrition education together with supplementation (20 mg elemental iron/week) and Group 4, given placebo, constituted the control group [16]. There were 58 mother-infant pairs in each group. No significant effect was observed with any of the interventions at 8 weeks. At 16 weeks, a significant positive effect of nutrition education (Group 1) on the iron status of the children was noted.

Long-term strategies and community-based approaches to nutrition education, with emphasis on optimum feeding schedules and diets for infants and children of different ages may possibly reduce the risk of IDA. Zlotkin, et al. developed a new way of providing supplementation: ‘Sprinkles’ are encapsulated micronutrients, packaged in single serving sachets. These can be added to food without changing the smell, colour or taste of the food item. It is claimed that sprinkles can be effective in the treatment of IDA in children in developing countries [17]. In a recent study, 102 non-anemic children aged 4 to 18 months from a high risk community were randomized to receive sprinkles containing 30 mg iron/day or a placebo for six months. Although administration of sprinkles was well tolerated, there were no differences in IDA prevalence from baseline to end, nor between groups [18].

The strategy for the effective and sustainable prevention of IDA in children should be based on a holistic approach that would include support of breastfeeding as recommended by WHO, promotion of healthy weaning practices, advocating home-fortification procedures which lead to an increase in the iron content of weaning foods, and improving the nutritional status of the women. Nutrition education of the population and an even distribution of the resources constitute the backbone of this strategy. Iron supplementation in infancy should not be the first step for the prevention of IDA.

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References