

Home fortification with Sprinkles to address childhood anaemia in Bangladesh

By: Farhana Haseen*

Despite many goals set by the health sector of Bangladesh, iron deficiency anaemia (IDA) is not being managed properly and is still considered a major public health problem, especially among infants and young children of up to 2 years of age and pregnant women. Although iron intervention programmes such as iron-folate tablets have been instituted for pregnant women at the national level from more than one decade in Bangladesh, a suitable effective strategy for infants and young children is still lacking. Recent national representative data shows that anaemia is persisting in children under five and is currently 49% over expected levels. Among all children under five, infants aged 6-11 months had the highest prevalence of anaemia at 77%, followed by infants 12-23 months at 58% and finally infants 24-59 months of age at 42%. In remote, hilly areas of the country, the prevalence is as high as 90% in young children 6-11 months of age and 80% among infants 6-23 months of age¹. This condition can be deleterious to their mental, social, emotional and physical development, with long-term consequences on economic productivity and national development. Considering these potentially negative impacts, this important area needs special attention if Bangladesh is to fulfill its commitment towards attaining the Millennium Development Goals (MDG).

From a public health standpoint there are three possible interventions to prevent IDA: dietary diversification to include iron rich foods; general fortification of staple foods including targeted fortification of complementary foods for infants and young children; and provision of medicinal iron supplements. In terms of prioritization, when dietary or fortification strategies are not logistically or economically feasible in Bangladesh, supplementation may be an alternative strategy. Taking this perspective, WHO has recommended blanket supplementation without screening to all infants and young children aged 6-24 months in regions where the prevalence of IDA exceeds 40%. Oral ferrous sulfate syrup or drops has been the primary source of iron to date. However, adherence to long-term ingestion of oral iron drops is often poor. Low compliance often results due to the unpleasant metallic after-taste from drops, staining of the child's teeth, abdominal discomfort and cumbersome and expensive transportation costs.

A group of scientists from the Hospital for Sick Children in Toronto were inspired by the challenge of developing a new method of iron delivery. They developed the concept of 'Sprinkles', a novel method to deliver iron and other micronutrients to children at risk using a 'home fortification' approach. Sprinkles are designed to improve adherence, acceptability and ease of use over conventional iron supplements such as iron drops and syrup. "Sprinkles"

are packed in single-dose sachets containing recommended micronutrients including microencapsulated ferrous fumarate, zinc, vitamins A, and C, and folic acid, which are easily sprinkled onto any semi-solid foods prepared in the household, at any mealtime during the day.

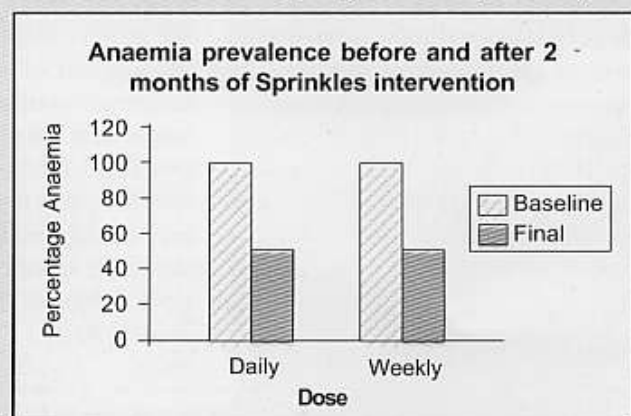
The standard Sprinkles formulation for children 6-24 months of age is as follows:

- 12.5 mg of iron as microencapsulated ferrous fumarate
- 5 mg zinc
- 300 µg vitamin A
- 160 µg folic acid
- 30 mg vitamin C

'Home fortification' is often used to describe the concept, because any homemade or unfortified food can be fortified by the addition of Sprinkles without appreciably changing the taste, color or texture of the food. The sachets are easy to use and convenient since one does not have to be literate to learn how to use them and no special measuring or handling of the dose is required (see following picture).

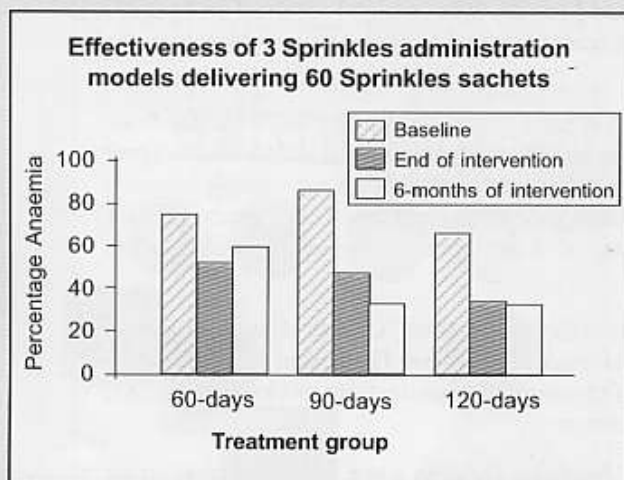


BRAC, the largest NGO in Bangladesh, is a successful pioneer in testing and implementing novel strategies in the improvement of nutrition of the poor. Sprinkles are an innovative approach to reduce the problem of micronutrient malnutrition, which would be acceptable and feasible in country settings. From 2003-2005, in collaboration with Hospital for Sick Children, BRAC carried out a number of studies to test the efficacy, dose effectiveness and develop a social marketing strategy for distribution of Sprinkles targeted at to children under two years. First, a community-based randomized controlled trial was conducted comparing the efficacy of daily vs.



weekly intervention of Sprinkles among children aged 12-24 months in rural areas. Home fortification of complementary foods with Sprinkles given either daily (12.5 mg iron) or once weekly (30 mg iron) for 8 weeks to mildly and moderately anaemic young children improved haematological and iron status to a similar extent. The anaemia cure rate was 54% and 53% in daily and weekly groups, respectively after the 8-week supplementation period and no significant between group differences were found.²

During the efficacy trial, it was revealed that caregivers preferred more flexible instructions for Sprinkles use. To compare the effectiveness of daily and flexible administration of Sprinkles on haematological status, adherence, and acceptability, 60 Sprinkles sachets (12.5 mg iron) were distributed in three regimens: i) daily over two months; ii) flexibly over three months; or iii) flexibly over four months among the children under 2 years. The haemoglobin response and acceptability of the flexible administration of Sprinkles over 4 months was greater than the daily administration for the control of anaemia up to 1 year after supplementation. Anaemia resolved in 65% of the children in the flexible-4-month group compared to 51% in the daily-2-month group and 54% in the flexible-3-month group. The percent of children who were successfully treated for anaemia and maintained a non-anaemic status at six-months post-intervention was significantly greater in the flexible-4-month (82%) and flexible-3-month (80%) groups compared to the daily-2-month group (53%).³



When an intervention is found to be efficacious in Bangladesh, a country specific and comprehensive strategy needs to be developed to scale up this intervention. Formative research was conducted to identify factors that can influence the acceptance and use of Sprinkles. High compliance and acceptability of Sprinkles was observed among the mothers of children taking Sprinkles.⁴ The following perceived benefits, as reported by mothers were made during studies on the Sprinkles intervention in Bangladesh:

- Increase in appetite
- Increase in playfulness and alertness
- General improvement of child's health
- Decreased incidence of disease
- Improvement of child's learning capacity
- Reduction of anaemia
- Increase in height and 'chubbiness'

Overall, Sprinkles have been successful in the treatment and prevention of anaemia and were demonstrated to be safe and well tolerated by children, easy to administer and acceptable to caregivers. The results and insights of the Sprinkles researches are considered to be useful for the policy makers to scale up a



Bangladeshi woman & child using sprinkle sachet in their food

programme to distribute Sprinkles to the million of children in Bangladesh. Locally available Sprinkles manufacturing has started at one Pharmaceutical Company. Estimated market price would be Tk. 1-2 (0.014-0.028 US\$) per sachet based on volume of product initially. For program settings, it is currently recommended to provide 60 Sprinkles sachets over a period of 120 days (4 months) to infants starting at 6 months of age. No more than one sachet a day should be used. Recently, a Micronutrient Interested Group (MIG) has formed including members from NGOs, social marketing and donor organizations to develop an effective and sustainable intervention based on home fortification with Sprinkles. Hopefully the day is not too far away when we can dream of a new generation without the extensive burden of iron deficiency anaemia, a major resource drainer of the country.

References:

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*The writer is Research Associate at Research and Evaluation Division, BRAC. BRAC Centre, 75 Mohakhali, Dhaka-1212, Bangladesh. E-mail: fhaseen02@yahoo.com