Review Article

Anemia in children: Major Public health Issue

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Abstract

Anemia in children is most prevalent morbidity along with malnutrition. Anemia not only reduces work capacity of a child but it also affects cognitive function.

Key words: Anemia, Children, IFA, Malnutrition

Introduction

According to WHO Global Database on Anemia, India is one of the countries with very high prevalence of anemia in the world. Almost 58 per cent of pregnant women in India are anemic and it is estimated that anemia is the underlying cause for 20–40 per cent of maternal deaths in India. India contributes to about 80 per cent of the maternal deaths due to anemia in South Asia [1]. Anemia affects 74 per cent of children under the age of three, more than 90 per cent of adolescent girls and 50 per cent of women [2]. As per a survey carried out in 2002 by the National Nutrition Monitoring Bureau, under the ICMR, 67% of the preschool children were anaemic [3]. Available studies by NIHFW New Delhi on prevalence of nutritional anemia in India show that 65% infant and toddlers, 60% 1-6 years of age, 88% adolescent girls (3.3% has hemoglobin <7 gm./dl; severe anemia) and 85% pregnant women (9.9% having severe anemia. The prevalence of anemia was marginally higher in lactating women as compared to pregnancy. The commonest causes of anemia in developing countries, particularly among the most vulnerable groups (pregnant women and preschool age children), are nutritional disorders and infections.. Urgent action from all concerned is called for since Anemia could translate into significant morbidities for affected individuals and consequent socio-economic losses for the country [4]. Causes of Nutritional Anemia in Children include:-

- Low iron stores at birth due to anemia in mother
- Non-exclusive breastfeeding
- Too early introduction of inappropriate complementary food (resulting in diminished breast milk intake, insufficient iron intake, and heightened risk of intestinal infections)
- Late introduction of appropriate (iron-rich) complementary foods
- Insufficient quantity of iron and iron enhancers in diet, and low bioavailability of dietary iron (e.g. non-haem iron)
- Increased iron requirements related to rapid growth and development during infancy and childhood
- Iron loss due to parasite load (e.g. malaria, intestinal worms)
- Poor environmental sanitation, unsafe drinking water and inadequate personal hygiene

One of the goals for the 12th Five Year Plan is to reduce anemia in girls and women by 50 per cent [5]. The National Nutrition Anemia Prophylaxis Program was launched in 1970 to prevent nutritional anemia in mothers and children. Under this program, the expected and nursing mothers as well as acceptors of family planning are given one tablet of iron and folic acid containing 60 mg elementary iron which was raised to 100 mg elementary iron, however folic acid content remained same (0.5 mg of folic acid) and children in the age group of 1-5 years are given one tablet of iron containing 20 mg elementary iron (60 mg of ferrous sulphate and 0.1 mg of folic acid) daily for a period of 100 days. This program is being taken up by Maternal and Child Health (MCH) Division of Ministry of Health and Family Welfare. Now it is part of RCH programme [4]. National Guidelines for Control of Iron Deficiency Anemia has four purposes:[2]

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1. To bring to attention of program managers of health and health related activities the serious negative consequences of anemia for the health and physical, mental, and economic productivity of individuals and populations

2. To layout IFA supplementation protocols across the life cycle (preventive strategy)

3. To define a minimum standard treatment protocol for facility based management of mild, moderate and severe anemia segregated by levels of care (curative strategy)

4. To broadly identify platforms of service delivery and indicate roles of service providers [2]

Even though supplementation of diet with iron and folic acid (IFA) has been a part of Government of India programming for over three decades, NFHS data shows that the levels of IFA intake remain low. For example, less than 20 per cent of women below 20 years took IFA supplements, and only 22 per cent of pregnant women reported consuming IFA for 90 days or more when they were pregnant. There are significant challenges in reaching the at-risk population as well as improving compliance[2].

According to NIHFW Studies National programs to control and prevent anemia have not been successful. Experiences from other countries in controlling moderately-severe anemia guide to adopt long term measures i.e. fortification of food items like milk, cereal, sugar, salt with iron. Nutrition education to improve dietary intakes in family for receiving needed macro/micro nutrients as protein, iron and vitamins like folic acid, B, B,C, etc. for hemoglobin synthesis is important. Nutritional Anemia Control Program should be comprehensive and incorporate nutrition education through school health and ICDs infrastructure to promote regular intake of iron/ folic acid-rich foods, to promote intake of food which helps in absorption of iron and folic acid and adequate intake of food[4].

Taking cognizance of ground realities discussed above the Ministry of Health and Family Welfare took a policy decision to develop the National Iron+ Initiative. This initiative will bring together existing programs (IFA supplementation for: pregnant and lactating women and; children in the age group of 6–60 months) and introduce new age groups. Thus National Iron+ Initiative will reach the following age groups for supplementation or preventive programming:[2]

• Bi-weekly iron supplementation for preschool children 6 months to 5 years

• Weekly supplementation for children from 1st to 5th grade in Govt. & Govt. Aided schools

• Weekly supplementation for out of school children (5–10 years) at Anganwadi Centers

• Weekly supplementation for adolescents (10–19 years)

• Pregnant and lactating women

• Weekly supplementation for women in reproductive age[2]

Adolescents in India are at high risk of Iron deficiency and thereby anemia due to accelerated growth and body mass building, poor dietary intake of iron and high rate of worm infestation [6]. In girls deficiency of iron is further aggravated with higher demands with onset of menstruation and also due to the problem of adolescent pregnancy and conception. Guided by the empirical evidence that weekly supplementation of 100mg elemental Iron and 500ug Folic Acid (IFA) is effective in decreasing incidence and prevalence of anemia in adolescents, MOHFW has launched the Weekly Iron and Folic Acid Supplementation (WIFS) Program for school going adolescent girls and boys and for out of school adolescent girls. The Program envisages administration of supervised weekly IFA Supplementation and biannual deworming tablets to approximately 13 crore rural and urban adolescents through the platform of Govt/Govt. aided and municipal school and Anganwadi Kendra and combat the intergenerational cycle of anemia [6].

Various cost effective measures have been recommended to improve the anemic status of the child population. Some of these include:- Diet Diversification by encouraging consumption of micronutrient rich foods- dark green leafy vegetables, lentils and vitamin C rich fruits, Food fortification by addition of micronutrients to processed foods and Supplementation using Food supplements which are highly concentrated vitamins and minerals produced by pharmaceutical manufacturers in the form of capsules, tablets or injections [2]. Besides the provision of micronutrient supplements, the following measures need to be taken simultaneously as long-term measures to prevent IDA (Iron Deficiency Anemia) in children:

• Promotion of exclusive breastfeeding for the first 6 months of life

• Appropriate and adequate complementary feeding with iron rich foods till 2 years of age

• Dietary diversification to include foods rich in absorbable vitamins and minerals and,

• Diagnosis and control and treatment of parasitic infections [2]

Anemia is a multi-factorial disorder that requires a multi-pronged approach for its prevention and treatment [7]. Iron deficiency and infections are the most prevalent etiological factors. However, other conditions may have a contributory role. The Copenhagen Consensus (2004) panel of eminent economists concluded that the returns of investing in micronutrient programs (including iron), among a list of 17 possible development investments, are second only to those of fighting HIV/AIDS [8]. The benefit-to-cost ratio of iron interventions based on resource savings, improvement in cognitive development and schooling, and physical productivity was estimated to be as high as 200:1 [2]

Conclusion

Preventin of anemia needs a multidisciplinary approach. Prevention and treatment of anemia in adolescent & young girl is first step. Proper dietary intake with iron and folic acid supplementation during pregnancy is also important to prevent anemia in infant. Exclusive breast feeding for six months followed by proper weaning is next step to prevent anemia in children.

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