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Prevalence of anemia in children admitted to SKMCH Bihar

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Abstract
Because anemia is the most common indicator used for screening iron deficiency, the terms 'anemia,' 'iron deficiency,' and 'iron-deficiency anemia' are often used interchangeably. However, prior to the development of iron-deficiency anemia, there have been mild-to-moderate forms of iron deficiency, where various cellular functions are impaired. The aim of the present study was to implement a screening program to detect iron deficiency anemia among children, 6 month to 15 years of age, using both non-invasive as well as laboratory techniques.
The 560 children's admitted to paediatric department in SKMCH from July 2017 to July 2018 were enrolled in the present study. From that 34 Childs were found anaemic. The children's in the age group of not less than 6 months and up to the 15 years of age were considered for the study. The approval of the institutional committee was taken prior to conduct of this study.
The present study concluded that the prevalence of anaemia in the childrens from 6 months to 15 years of age. The study suggests that the anaemia is still a major health problem in our country. Childhood anaemia still continues to be a significant public health problem in school childrens. Government policies should be made to fortify iron with flour, salt, oil etc., in order to tackle the problem of anemia at gross root level.

Keywords: hemoglobin concentration, anemia, childrens, SKMCH, etc

Introduction
Anemia, Iron deficiency and Iron-deficiency anemia are three conditions with minor differences. Abnormally low hemoglobin level due to pathological conditions is defined as anemia. Iron deficiency is one of the most common causes of anemia. Inadequate dietary iron causes iron deficiency. In the case of a girl, increased blood loss can be a cause of anemia. Anemia, when caused by severe deficiency of iron is termed as iron-deficiency anemia. Other causes of anemia are deficiency of folic acid (folate), chronic infections (especially from malaria) and hereditary hemoglobinopathies. Iron is needed by the body to make red blood cells. Improper nutrition significantly decreases the child's ability to learn and remember and the child is unable to perform outdoor physical activities like sports. It also blunts intellectual capacity. This can be solved by changing nutritional attitudes and behaviour of adolescent girls (who would become mothers within few years).
Malnutrition affects the mental and physical development of a child from the time it begins to grow in its mother's womb. If the mother is malnourished the child is very likely to be unhealthy at the time of birth. From conception to 24 months of age is the critical period. Primarily poor access to nutritional diets is the cause of malnutrition in both mother and child. In nutritional anemia the blood hemoglobin level drops to an abnormally low level due to deficiency in food nutrients (iron, folic acid and vitamin B12). The level of iron in a child's blood at the time of birth depends upon the store of iron in the mother during pregnancy. Iron deficiency hampers both mental and physical growth in children as iron plays an important role during rapid growth of a child. The brain is the fastest developing organ during infancy and childhood. The damage is irreversible. But iron deficiency is preventable with timely intervention [1].
To prevent anemia, supplementary foods especially rich in iron should be administered to the child from four months of age. Pulses, beans, peas, green leafy vegetables are fairly good sources of iron. Iron in egg however may not be absorbed easily. Hook worm infestation must be managed with anthelmintics. Children should be encouraged to wear shoes while going to field to prevent infestation with hook worm larve [2].
Severe anemia usually comprises a small proportion of the cases of iron deficiency anemia in a population but may cause a large proportion of the severe morbidity and mortality related to iron deficiency. It is important that primary health care providers are able to recognize these cases and treat or refer individuals with severe anemia. The training and supervision of this activity in primary health care settings becomes a priority activity when the prevalence of severe anemia in population groups exceeds 2%. Eating a diet with iron-rich foods can help treat iron-deficiency anemia. Good sources of iron include, meats - beef, pork, lamb, liver, and other organ meats, poultry - chicken, duck, turkey, liver (especially dark meat), fish - shellfish, including clams, mussels, and oysters, sardines, anchovies, leafy greens of the cabbage family, such as broccoli, kale, turnip greens, and collards, legumes, such as lima beans and green peas; dry

beans and peas, such as pinto beans, black-eyed peas, and canned baked beans, yeast-leavened whole-wheat bread and rolls, iron-enriched white bread, pasta, rice, and cereals [3].

The risk of developing iron deficiency anemia is increased in infants younger than 12 months who drink cow's milk rather than breast milk or iron-fortified formula and young children who drink a lot of cow's milk rather than eating foods that supply the body with more iron. Iron deficiency anemia most commonly affects babies 9 - 24 months old. All babies should have a screening test for iron deficiency at this age. Babies born prematurely may need to be tested earlier. Common symptoms are blue-tinged or very pale whites of eyes, blood in the stools, brittle nails, decreased appetite (especially in children), fatigue, Headache, irritability, pale skin color (pallor), shortness of breath, sore tongue, unusual food cravings (called pica), and weakness [4].

Substantial efforts have been made in the past several decades to implement programs to reduce iron deficiency. Yet, compared with other micronutrients such as vitamin A and iodine, overall progress in reducing iron deficiency has been limited. Such limited progress is not attributed to a lack of scientific knowledge about the prevalence, causes or consequences of iron deficiency, but to limited implementation of effective interventions and ineffective communication tools [5].

"Prevention is better than cure" the best treatment for iron deficiency in children is prevention. Adopting healthy lifestyles early in childhood can avoid serious health problems in youth and adulthood (Myers *et al* 2000). Prevalence of iron therapy among children in developing country is consistently high. This indicates that there is need for health education. Nutrition education can be impacted to the children as a part of school health programme [6].

Because anemia is the most common indicator used for screening iron deficiency, the terms 'anemia,' 'iron deficiency,' and 'iron-deficiency anemia' are often used interchangeably. However, prior to the development of iron-deficiency anemia, there have been mild-to-moderate forms of iron deficiency, where various cellular functions are impaired. The aim of the present study was to implement a screening program to detect iron deficiency anemia among children, 6 month to 15 years of age, using both non-invasive as well as laboratory techniques.

Methodology

The 560 children's admitted to paediatric department in SKMCH from July 2017 to July 2018 were enrolled in the present study. From that 34 Childs were found anaemic. The children's in the age group of not less than 6 months and up to the 15 years of age were considered for the study. The approval of the institutional committee was taken prior to conduct of this study. All patients were informed consents. The aim and objective of the present study were informed to the parents.

Hb concentration was estimated as per Cyanmethemoglobin method [7]. As anemia is classified into three degree according to WHO; mild, moderate and severe. Hb cut-off values of anemia for children below 6 years were 10.0-10.9 g/dl (mild), 9.0-9.9 g/dl (moderate) and < 9.0 g/dl (severe). Hb cut- off of anaemia for children 6-12 years old were 11.0-11.9 g/dl (mild), 10.0-10.9 g/dl (moderate) and < 10.0 g/dl (severe) [8]. Following are the inclusion and exclusion criteria for the enrolled study group.

Inclusion Criteria

- Having age group of 6 months to 15 years

Exclusion Criteria

- Children's having history of low birth weight & premature birth
- Previous convulsion, birth asphyxia
- Developmental delay
- Neurological deficit
- Any other disorders

Results & Discussion

The data from the enrolled childrens were collected and presented as below.

Table 1: Age group and No of Cases

Age	Number of Cases	Positive Cases	Positive Cases Total
6 month to 2 year	58	4	18
2 to 3 years	186	8	
3 to 6 years	148	6	
6 to 9 years	89	7	16
9 to 12 years	55	4	
12 to 15 years	24	5	
Total	560	34	34

Table 2: Distribution of Anemia based in Hemoglobin Levels

Age	Number of Cases	Total
Below 6 years		18
10.0 – 10.9 g/dl (mild)	8	
9.0 – 9.9 g/dl (moderate)	5	
< 9.0 g/dl (severe)	5	
Above 6 years		16
11.0 – 11.9 g/dl (mild)	6	
10.0 – 10.9 g/dl (moderate)	7	
< 10.0 g/dl (severe)	3	
Total	34	34

Anemia during infancy and childhood is one of the most common clinical conditions responsible for varying degrees of morbidity and rarely mortality. Iron deficiency is the most common cause of anemia. It is also the most common nutritional disorder in humans. The demand for erythropoietic factors increases during infancy and childhood because of rapid growth. This coupled with unbalanced nutritional status and excessive loss of blood in some cases contributes to the high prevalence of anemia in this age group [4].

Firdos and Poornima [9] have reported anemia in 72.79% of children below 5 years of age and Sahu *et al*. [10] have reported anemia in 93.8% of children below 5 years in their community-based study. According to the WHO global database of anemia 1993–2005, 74.3% of children under 5 years of age were anaemic. The National Family Health Survey -4 showed the prevalence of anemia in 58.4% of under-five children.

The World Health Organization has proposed that if the

prevalence of anaemia in a region is between 5% and 20%, appropriate interventions based on food diversification, food fortification, iron supplementation and controlling infectious diseases should be considered [11].

Weekly iron supplementation for school children in particular for primary school children has great important to curve the incidence of iron deficiency anemia. Fortification of foods (such as iron fortified biscuits) is another strategy which could be considered for preventing iron deficiency among school children.

Hemoglobin concentrations are normally higher at birth than at any other time of life, as a result of the adaptation of the fetus to the hypoxic environment of the uterus. In addition, the neonatal reserves of storage iron are relatively generous. Consequently, most newborn infants are well supplied with iron. Between birth and four months of age, there is almost no change in the total body iron in the term infant. The need for exogenous iron is therefore modest during this period. The abundant iron stores present at birth help to provide for synthesis of hemoglobin, myoglobin, and enzyme iron during the first four months. Additional iron from the hemoglobin breakdown is also made available to meet the iron needs because the concentration of hemoglobin declines from a mean of 17.0 g/dl at birth to a low of 11.0 g/dl at two months of age. This low point used to be called the early anemia of infancy, and was distinguished from the 'late anemia of infancy,' because it was unresponsive to iron treatment.

After about four months of age, a gradual shift occurs from an abundance of iron to the marginal iron reserves that characterize the period of continued rapid growth. This window of vulnerability to iron deficiency is the major focus of concern. The transition from feast to famine with respect to iron is primarily due to the large amount of iron required to maintain a near constant mean hemoglobin concentration of 12.5 g/dl within a rapidly expanding blood volume between four and twelve months. A large amount of iron, about 0.8 mg/day, must be absorbed from the diet during this period. The rate and extent to which storage iron becomes depleted can be estimated from the changes in the concentration of serum ferritin and depends both on the magnitude of iron storage at birth and on the postnatal diet.

A cross sectional study children aged 12 to 23 months in 2 rural districts of Karnataka, India. Children were tested for hemoglobinopathy, malaria infection and hook worm infestation. Anthropometric measurements, nutritional intake, family wealth and food security were recorded. In addition, maternal hemoglobin level was measured. Anemia (hemoglobin level < 11.0 g/dl) was detected in 75.3% of the 401 children sampled. Anemia was associated with iron deficiency (low ferritin level), maternal anemia, and food insecurity [12].

NFHS -3 survey report says the incidence of anemia in children 6- 35 months is 79.2% with 72.7% in urban areas and 81.2% in rural areas. By far the most common cause is iron deficiency. Three stages of iron deficiency have been described. First stage characterized by decreased storage of iron without any detectable abnormalities. An intermediate stage of latent iron deficiency, that the iron stores are exhausted, but iron deficiency has yet not occurred. This is the most prevalent stage in India. The third stage is the overt iron deficiency when there is a decrease in the concentration of circulating hemoglobin due to impaired hemoglobin synthesis [13].

According to WHO report it is more frequent in children and women around the world. It is the only nutrient deficiency and is significantly prevalent in developed nations. It also figures out that around 30-40% of all female preschool children are iron deficient [14].

According to UNICEF report 40-50% of under five children are having iron deficiency anemia. It is more in developing countries compared to industrialized countries. It also shown that iron deficiency anemia affects mental development and learning capacity. 9% of toddler is in the world are experiencing iron deficiency anemia. It is estimated that 2.15 billion under 5 children are anemic victims [15].

A cross sectional community based study with analytic component was conducted among under five children during June – July 2005 to assess magnitude of anemia and deficiency of iron to compare the factors responsible for anemia among anaemic and non-anaemic cases in Madhya Pradesh. The major determinants identified were open field toilet habits; chronic illness and presence of intestinal parasites were positively associated with anemia. Among all cases 50.1% were due to iron deficiency and 31.3% were due to folic acid deficiency. They concluded that one among two anaemic cases were due to iron deficiency. There was delay in motor development in all the cases [16].

Conclusion

The present study concluded that the prevalence of anaemia in the childrens from 6 months to 15 years of age. The study suggests that the anaemia is still a major health problem in our country. Childhood anaemia still continues to be a significant public health problem in school childrens. Government policies should be made to fortify iron with flour, salt, oil etc., in order to tackle the problem of anemia at gross root level.

References

1. http://vikaspedia.in/health/child-health/the-problem-of-childhood-and-maternal-anemia
2. Ghai OP, Paul KV, Bagga A. Essential Paediatrics.7nth ed. New Delhi: CBS Publishers and distributors. 299-301.
3. Available from: URL:http://en. wikipedia. org/wiki/irondeficiency/
4. David Zieve, Medline [online] 2011 Feb28 [cited 2011 October 16]; Available from: URL: http:// www. nlm.nih.gov
5. Ray Yip. Prevention and control of iron deficiency: Policy and strategy issues. The Journal of Nutrition. 2002; 132(4):8135-95.
6. Available from: URL: http://en. wikipedia. org/ wiki/ irondeficiency/
7. Pollitt E. Effects of a diet deficient in iron on the growth and development of preschool and school aged children. Food and nutrition bulletin. 1991; 13:110-18.
8. WHO U. World Health organization, UNICEF & UNU Iron Deficiency. Indicators for Assessment and Strategies for prevention 1998. World Health Organization: Geneva, 1998.

9. Firdos S, Poornima S. Anemia among hospitalized children at a multispecialty hospital, Bangalore (Karnataka), India. J Family Med Primary Care. 2014; 3(1):256-57.
10. Sahu T, Sahani NC, Patnaik L. Childhood anemia: a study in tribal area of Mohana block in Orrisa. Indian J Com Med. 2007; 32(1):106-8.
11. Iron deficiency anaemia. Assessment, prevention and control. A guide for programme managers. Geneva, World Health Organization, 2001, (WHO/NHD/01.3).
12. Sant Rayan Pasricha, James Black, Sumitra Muthayya, Anita Sheat, Vijay Bhatt, *et al*. Determinants of anemia among younger children in rural India. Paediatrics. 2010; 14:140-9.
13. Park K. Park Text book of preventive and social medicine. 20th ed. Jabalpur: Banarasi das Bhanot, 2009, 538-39.
14. Preventing micronutrient deficiencies. FAO/ WHO report 2002, ICN fact sheet 1.
15. Ross Harton J. economic consequences of iron deficiency report. Micronutrient initiative publication, 2003, 1-48.
16. Haidar. Jamal Population and nutrition. Journal of health, 2010, 625-30.