

Original Research Article

A SURVEILLANCE OF ONGOING GOVERNMENT NUTRITIONAL PROGRAMS AND PREVALENCE OF NUTRITIONAL ANEMIA AMONG CHILDREN'S IN RURAL TERTIARY CENTER – AN OBSERVATION ANALYTIC STUDY

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ABSTRACT

Background: The objective is to determine various aetiology and demographic profile in young children with anaemia & its severity. To determine different government nutritional programs (anemia mukhta bharat) and breast & complementary feeding programs and its impact in preventing nutritional anemia. To determine clinical markers commonly seen with nutritional anaemia.

Materials and Methods: This observational study assessed demographic and aetiology associate with anemia amongst young children of age 6-60 month (golden period of growth). In paediatric Anemia is defined as HB level less than 5th percentile or 2SD below mean value of age.

Results: Out of total 75 cases, 64% were males while 36% were females. Further, they were divided into two age groups and it was found that children with age 6-24 months were about 35 cases i.e 46.6% of which 16(45.7%) female and 19(54.2%) male & while amongst 24-60 months, there were 40 cases i.e 53.3 of which 11(27.5%) were females and 29(72.5%) were male. 52% of our subjects had moderate anemia followed by 44% severe anemia and 4% with mild anemia. Of study population 1% mildly anaemic, 47.9% moderate, 50% severe in comparing with Adequate breast feeding, timely introducing of complementary feeding v/s improper complementary feed (p=0.0026). Correlation of anaemic severity among children at tertiary rural centre and maternal nutritional status and education – 4% of study population were mildly anemia, 50% of population were moderately anaemic and 45% of population were severely anaemic. In terms of clinical features, Nail change(koilonychia/palatynychia) was observed in 69 (92%) of population while Knuckle pigmentation in 52(69.3%) Oedema was observed in 15 (20%), Icterus 9 (12%), Clubbing 17(22.6%), Lymphadenopathy in 8(10.6%), Haemolytic facies 8 (10.6%), Bone tenderness 13(17.3%), Mucocutaneous bleed 2 (2.7%). Only 16% had normal nutritional status while 49.3% were under severe acute malnutrition followed by 34.7% with moderate acute malnutrition. (P=0.0026). Iron deficiency anemia was most common among the population, Almost 52 (69.3%) of population were found iron deficient. vitamin B 12 cases were 33 (44%) Sickle anemia cases were 8(10.6%) and thalassemia was 1 (1.33%), G6pd and haemolytic anemia were 0. Anemia due to other causes like leukaemia, aplastic anemia and due to other systemic illness were 14 cases (18.6%).

Conclusion: Anemia amongst population male is more common in my study suggestive of ice berg phenomenon due to less female child being brought earlier to hospital. Several years elapse between onset of symptoms and in

arriving at an accurate diagnosis due to lack of primary health care services, particularly in rural India. Despite of several government strategies and programmes on anemia, the beneficiary population still suffered from nutritional anemia. Nutrition deficiency is major cause of anemia, among that iron deficiency (Pandu Rog) contribute 88%, which indicate iron supplementation in children for prevention of anemia. Appropriate age of complementary feeding decreases the anemia & and its severity. 6*6*6 strategies of anemia mukt bharat is inevitable against nutritional being major cause of anemia in 6-60 month children.

Keywords: Nutritional Anemia, Children, Government Nutritional Programs, Rural Health, Iron Deficiency Anemia, Child Nutrition, Poshan Abhiyaan, ICDS.

INTRODUCTION

Anemia is widely prevalent and is a major cause of morbidity. Globally anemia affects 1.62 billion people which correspond to 24.8% of the population. The highest prevalence is seen in preschool-age children (47.4%), and the lowest prevalence is seen in men (12.7%). Various surveys including the National Family Health Survey (NFHS) have revealed that anemia is highest in children below 6–35 months of age. It is more common in rural areas as compared to urban population.^[1] National Family Health Survey (NFHS)-3,^[1] data shows that 7 out of every 10 children age 6 to 59 months in India are anemic. Three percent of children age 6 to 59 months are severely anemic (less than 7.0 g/dl), 40 percent are moderately anemic (7.0-9.9 g/dl), and 26 percent are mildly anemic (10.0-10.9 g/dl). Anemias among children is widespread throughout India. More than half of young children in 24 states have anemia, including 11 states where more than two-thirds of children are anemic. By all accounts India falls in the category of high magnitude prevalence for anemias. According to NFHS-2 (1998-1999) Early childhood prevalence -74%, NFHS-3(2006-07) Preschool prevalence-79%.^[1-9]

National Family Health Survey (NFHS)-3^[1] data shows that 7 out of every 10 children age 6 to 59 months in India are anemic. Various contributing studies S. Kaur, P.R. Deshmukh & B.S. Garg in 2006^[26] aimed to study the epidemiological correlates of nutritional anaemia among adolescent girls in rural Wardha. Sandip Ray in 2016^[30] conducted cross sectional study shows that nutritional being major determining factor for anaemia in children less than five years age. Shally Awasthi et al. in 2003⁽³⁵⁾ performed a study show children (3 to 5 years) and its association with malnutrition in rural Barabanki district of Uttar Pradesh, India Venkatesh G et al. in 2013⁽³⁸⁾ conducted a study to quantify the magnitude of anaemia and its association with malnutrition. R. Kumar in 2014⁽⁴⁴⁾ conducted a study on 100 subjects to find out the prevalence and etiology of nutritional anaemia in children aged 6 months to 60 months in Fatehabad district of Haryana. A Prospective Birth Cohort in China. Scientific reports. 2017 Mar 23;7:44726, with WHO recommendation also show correlation between Age

of Complementary Foods Introduction and Risk of Anemia in Children Aged 4–6 years.^[10-21]

During every child hood period of child (golden period of growth) nutritional play momentous role, though there are various etiological factor for child being anemic but nutritional being major contribution one. Early infancy period upto age of 2 year duration of breast feeding and complementary feed is prime source of nutrition in which maternal education and maternal health status contribute tremulous in determining health of next generation. Various government nutritional programs (anemia mukht bharat) had been launched to eradicate this root factor but still beneficiaries were spurn with underutilized resources.^[22-38]

Government programs launched various programs to exterminate anemia and encourage breast feeding, for improvement in maternal status by providing door step facilities, easy availability of necessary and adequate medicines, removing social stigma.^[39-49]

MATERIALS AND METHODS

This is prospective observational study in which 75 children among 6- 60 month of age group who were anemia as per WHO criteria (HB 2SD below mean value of age) admitted in paediatric ward of Dhiraj hospital during December 2019 to October 2021 were included after approval from the institutional ethics committee. All children's were enrolled after taking written informed consent from parents or guardians, while those who were less than 6 month and above 60 months and those whose parents did not give consent were excluded.

The sample size of 75 was obtained by using formula $n' = \frac{NZ^2P(1-P)}{d^2(N-1)+Z^2P(1-P)}$ [where n' = sample size with finite population, N = Population size, Z = Z statistic for level of confidence, P = Expected proportion (if the prevalence is 20% $P = 0.2$), D = Precision (if the precision is 5%, then $d = 0.05$)].

Data was collected as per predesigned proforma
Tools used for study were

- hemogram (CBC): by Sysmex haematology analyser method and manual haemocytometer
- Peripheral smear: wedge technique
- Reticulocyte count test
- Hb electrophoresis: by HPLC

- Bone marrow examination: By aspiration technique (field stain method, pearl blue stain method)
- ESR: Westergren method
- VIT B 12: fluorescence spectroscopy method
- Serum Iron: colorimetry method (human -kit)
- Serum TIBC: colorimetry method (human -kit)
- Serum Ferritin: Nephelometry -method (agape-kit)
- Peripheral smear : _Wrights's stain and Geimsa stain technique
- Body weight: basket / pan type of weighing scale and beam balance scale
- Length: Harpenden infantometer
- Height: stadiometer
- Weight for age: WHO standard percentile and Z-score charts
- Length or Height for age: WHO standard percentile and Z-score charts

The physical finding like pallor, fatigue, Anorexia, tachycardia glossitis, koilonychia, knuckle pigmentation, angular cheilosis, mucocutaneous bleed were recorded. The finding of investigation done as per standard protocol were noted. It will be sorted out into various aspect of the study and then extrapolated to arrive at conclusion. Chi square test will be used for this study purpose.

Different statistical methods to be used are Ratio and percentage, Tables, Graphs, Flow charts were used.

RESULTS & DISCUSSION

In present study more than half of subject were males, indicates iceberg phenomenon of female child. Age distribution criteria show anemia is more common among after 24 month of age group which contribute 40 out of 75 cases, i.e. Out of total 75 cases, 64% were males while 36% were females. Further, they were divided into two age groups and it was found that children with age 6-24 months were about 35 cases i.e. 46.6% of which 16(45.7%) female and 19(54.2%) male & while amongst 24-60 months, there were 40 cases i.e. 53.3 of which 11(27.5%) were females and 29 (72.5%) were male.

In present study comparing various aetiology of anemia, it show Iron deficiency anemia were most common among the population, Almost 52 (69.3%) of population were found iron deficient. vitamin B 12 cases were 33 (44%) Sickle anemia cases were 8(10.6%) and thalassemia was 1 (1.33%), G6pd and

hemolytic anemia were 0. Anemia due to other causes like leukemia, aplastic anemia and due to other systemic illness were 14 cases (18.6%) Similar Study on nutritional anemia in children less than five years age done by Sandip Ray, majority of cases (75.0%) were in months - 2 years age group. 139 (69,5%) subjects had iron deficiency, 86 (43.0%) had Vitamin B12 deficiency and 28 (14.0%) had folic acid deficiency.

Longer Breastfeeding Associated with Childhood Anemia in Rural South-Eastern Nigeria. Anemia Was the Most Common Childhood Chronic Systemic Disease. Out of 90 children tested, 57% were female (n=51) and 43% were male (n=39). In conclusion, persistent childhood anemia was likely influenced by the low iron content of breastmilk, an indication of maternal anemia and poor nutrition. Although continuous breastfeeding is a known strategy to reduce child mortality, a family-centered preventive intervention to diagnose and treat childhood anemia could lead to reduced morbidity and mortality from anemia. IN comparison with our study population which include 1% mildly anaemic, 47.9% moderate, 50% severe in comparing with Adequate breast feeding, timely introducing of complementary feeding v/s improper complementary feed (p=0.0026), and further comparing maternal status Correlation of anaemic severity among children at tertiary rural centre and maternal nutritional status and education – 4% of study population were mildly anemia ,50% of population were moderately anaemic and 45% of population were severely anaemic

In present study Only 16% had normal nutritional status while 49.3% were under severe acute malnutrition followed by 34.7% with moderate acute malnutrition. (P=0.0026). ie of total 75 cases 52% of our subjects had moderate anemia followed by 44% severe anemia and 4% with mild anemia(p=0.0745). Shally Awasthi et al. in 2003, to assess the prevalence of anemia among preschool children (3 to years) and its association with malnutrition in rural Barabanki district of Uttar Pradesh, India, it was found that among the 67.3% underweight children the mean haemoglobin level was 9.85 (SD: 1.67) as compared to 10.39 (SD: 1.62) in those without malnutrition (P <0.0001). It was also said that stunted children (87.6%) had statistically significantly lower mean haemoglobin levels than those not stunted. The odds ratio of an underweight and stunted child having moderate to severe anemia was 1.66.

Table 1: Age distribution

Age group	Females (N=27)	Males(N=48)	Cases(N=75)
6-24 months	16 (59.5%)	19 (39.5%)	35(46.6%)
24-60 months	11 (40%)	29 (60%)	40(53.3%)

Significance: RR= 1.662; 95%CI= 0.9075 to 3.107, P=0.1478.

Table 2: correlation of anemia with child nutrition status

Type of nutritional status	Total cases (75)
Normal	12(16%)
Severe acute malnutrition (SAM)	37(49.3%)
Moderate acute malnutrition (MAM)	26 (34.6%)
Nutritional status (P=0.0026)	

In study 16% of cases are normal, 49.3% are SAM, 34.6% are MAM
Of basis of mal nutritional population is further classified in mild, moderate and severe anemia

Table 2(a)Of SAM: 1 case is of mild anemia, 16 cases are of moderate anemia and 20 cases are of severe anemia of total 37 cases

Mild anemia	Moderate anemia	Severe anemia
1(2.7%)	16(43.2%)	20(54%)

Table 2 (b) Of MAM: mild-0 cases, moderate were 15 cases, severe were 11 cases of total 26 cases

Mild anemia	Moderate anemia	Severe anemia
0	15(57.6%)	11(42.3%)

Table 2 (c)Of normal: 2 were mild anaemic, moderate anomic were 10 and severely anemia were 0 of total 12 cases.

Mild	Moderate	Severe
2(16.6%)	10(83.3%)	0

Table 3: Co- relation of anemia with appropriate age of complementary feed introduce

Breast feed & complementary feeds (P=0.1468)				
Mild moderate severe total				
Properly breast feed with appropriate age of complementary feeding introduce	2 (7.4%)	16 (59.3%)	9 (33.3%)	27 (36%)
Inappropriate breast and complementary feeding introduce	1 (2.1%)	23 (47.9%)	24 (50%)	48 (64%)

Table 4: etiological factor of anemia

Aetiology	Number of cases	%
Iron deficiency	52	69.3
Vitamin B12	33	44
Sickle cell diseases	8	10.6
Thalassemia	1	1.33
G6PD	0	0
Other causes	14	18.6

Table 5: Peripheral smear findings of the subjects vs. degree of anemia.

Peripheral smear	Mild Anemia	Moderate Anemia	Severe Anemia	Total
Microcytic hypochromic anemia	0	11 (50%)	11 (50%)	22 (29.3%)
Microcytic Normochromic anemia	2 (13.3%)	10 (66.7%)	3 (20%)	15 (20%)
Normocytic normochromic anemia	1 (11.1%)	6 (66.7%)	2 (22.2%)	9 (12%)
Dimorphic anemia	0	12 (41.4%)	17 (58.6%)	29 (38.7%)

F=0.5617; P=0.0422

CONCLUSION

Anemia amongst population male is more common in study suggestive of ice berg phenomenon due to less female child being brought earlier to hospital. Several years elapse between onset of symptoms and in arriving at an accurate diagnosis due to lack of primary health care services, particularly in rural India. Pallor, tiredness, nail changes is more common clinical features noted Nutrition deficiency is major cause of anemia among that iron deficiency contribute 88%, which indicate iron supplementation in children for prevention of anemia. Appropriate age of complementary feeding decreases the anemia & and its severity. It is highly recommended for the medical health personals to make an appropriate diagnostic approach towards anaemia, where in clinical examination and peripheral blood smear examination are at the baseline of the patient management.

In spite of great effort by government programs (anemia mukht bharat) study show that nutrition particularly iron deficiency anemia being most common cause. although providing comprehensive

knowledge regarding breast feed and complementary feed and maternal health status, social taboos are empowering government effort to eradicate anemia. 6*6*6 strategies of anemia much bharat is inevitable against nutritional being major cause of anemia in 6-60 month children.

POSDHA yojana 2018 is also partially succeed in changing the scenario of anemia .

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