ORIGINAL ARTICLE

Is Iron Deficiency Anaemia more Prevalent in Malnourished Children under Five years in Suburban Areas? A Descriptive Analytical Study

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ABSTRACT

Background: Malnutrition and iron deficiency anaemia are quite prevalent in developing countries.
Aims: To assess the frequency of iron deficiency anaemia among malnourished children in suburban population of Lahore, to identify the underlying etiological factors of iron deficiency anaemia in children under 5 years and to make recommendation for iron supplementation in children at school or Basic health unit.
Study Design: A descriptive analytical study
Settings: This study was conducted at Pediatric Department Punjab Social Security Hospital, Lahore
Study Period: Jan- 2018 to June-2018.
Methods: All children presenting in hospital from 6 months to 5years presenting to OPD/Emergency department (Normal-malnourished) were enrolled in study. They were divided into two groups, malnourished and well-nourished based on WHO growth charts (Z-score types). Thalassemic children were excluded from the study. Children were examined and investigated as per protocol to establish iron deficiency anaemia. All necessary information were noted on proforma. Children with hemoglobin level less than 11gm/dl were considered as anaemic. All anaemic children were treated by iron supplements.
Results: Data were analyzed by computer-based software and results were analyzed using chi square test. Results were considered as significant if p-values is less than 0.05.
Conclusion: Iron deficiency anaemia is as common in well-nourished children as in malnourished children although underlying etiology may be quite variable. Poverty, illiteracy, maternal food fad and careless attitude were main underlying causes in our study. Universal iron fortification(flour) and regular iron supplementation to children through basic health units and school health services should be done on regular basis to correct the iron deficiency anaemia and related health problems.
Key words: Protein energy malnutrition (PEM), Iron deficiency anaemia (IDA)

INTRODUCTION

Iron is very important in maintaining many body functions, including the production of hemoglobin. .Iron deficiency at younger age may contribute to poor motor development at later age (16). This study to assess the prevalence of iron deficiency anemia in well-nourished children vs malnourished children and to identify factors linked with iron deficiency anemia in suburban area of Lahore.

Many similar studies have found association between iron deficiency anaemia and poor cognitive and motor development in later part of life. Studies also suggest that infants with IDA continue to have Neuro-behavioral problems into middle childhood. Inhuman being evidence also suggest that infants with iron-deficiency anemia are at risk for poor motor, social, emotional, and physical development. The iron deficiency anaemia has become a public health issue.

Provision of appropriate nutrition ensures the best possible start in life. In 2016, an estimated 155 million children under the age of 5 years were suffering from stunting, while 41 million were overweight or obese. Approximately 45% of deaths among children under 5 years of age are associated with to malnutrition. On 1 April 2016, the United Nations (UN) General Assembly proclaimed 2016–2025 the United Nations Decade of Action on Nutrition. (WHO fact sheet May (3-5).

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MATERIAL AND METHODS

This study was done at pediatric department Punjab social security hospital, Lahore, Pakistan.750 children cases were enrolled in the study who fulfilled inclusion criteria. They were divided into two groups, cases (n=400) and control (n=350) after randomization using SPSS V20.Children with weight between -2 to +2 (WHO Z-score) were taken as controls (Group-2) and children with weight more than -2 (WHO Z-score) were taken as cases(group-1).All children were seen by pediatrician and after recording history underwent a complete physical examination before enrollment and during each follow up. Laboratory test including CBC, Serum iron and total iron binding protein (TIBC) were carried out to establish the iron deficiency anaemia. Children with hemoglobin less than 11 gm% were labeled as anaemic as per WHO guidelines[16]. During the trial, the results (clinical and laboratory) were noted.

Data analysis: It was carried out by computer-based software. The results were analyzed using SPSS. Chi-square test was used to analyze the results. Results were considered significant when P value was less than 0.05.

RESULTS

Seven hundred and fifty children were enrolled in this study 400(53%) as cases (malnourished) and 350(47%) as control (well nourished) shown in (Table 1). General differences in study groups (case and control) like age, gender was statistically insignificant with a p value of 0.475 & 0.782 respectively. Population cohort analysis was

statistically significant (P-value 0.00) as shown in Fig. 1 and table 1.

Gender distribution showed 208(52%)/161(46%) were male and 192(48%)/189(54%) female child in the malnourished and well-nourished groups respectively and this was also statically insignificant as P value 0.982. Age wise analysis showed 52%/48% children were enrolled in group-1 (0.6-3 years, n=192/208) and 48%/52% children were enrolled in group-2 (3-5 years, n=168/182) in cases and control group respectively, but this difference was statistically insignificant (p value 0.463). As for population cohort is concerned 34(9%) belongs to urban population 166(47%) suburban and 150(42%) from rural population in control group while the proportion of urban, suburban and rural population in case group are 43(10%), 175(43% and 182(45%) respectively. Statistical analysis shows P value of <0.05, hence statistically significant.

Hence most of the patients belong to suburban and rural population. As for the etiological factor of iron deficiency anaemia are concerned, common etiological factors identified were poverty 110(27.6%), illiteracy 98(24.6%), multiple factors 96(24.1%) and maternal food fads 48(12.1%) and careless attitude 28(7%) towards feeding children. Statistical report also showed that in well nourished (control group),multiple factors 66(18.8%) was the most common cause followed by careless attitude 62(17.7%),diarrheal illness 51(14.5%), illiteracy 48(13.7%), food fads 44(12.5%) respiratory illness 41(11.7%) and poverty 38(10.8%), while in malnourished (cases) group multiple factors 74(18.5%), illiteracy 66(16.5%) and food fads 65(16.3%) were the three most common causes identified in our study. These differences were considered significant as (p value<0.05). When we analysis our data for prevalence and severity of anaemia in our study cohort.

Prevalence of iron deficiency anaemia was 350(87%) and 275(78%) incases and control group respectively. While 50(12.5%) and 75(21.4%) were non anaemic in cases and control

These results are also considered as statistically significant as p-value<0.05. As for the prevalence and severity of Iron deficiency anaemia is concerned, our analysis showed that iron deficiency anaemia (IDA) is present in both study groups (87% and 78%) (n=268, n=274) respectively. Significant difference noted was moderate to severe anaemia is more common in malnourished (cases) group 150(37.5%) and 200(50%) as compared to well-nourished groups, 100(28.5%) and 75(21%) respectively. While mild iron deficiency anaemia was more common in well-nourished group 125(35.7%) compared to 50(12.5%) in malnourished groups. This difference in prevalence and severity of Iron deficiency anaemia (IDA) was also statistically significant (Fig-3).

Table 1: Chi Square Test

	Value	Df	Asymp Significance
Age difference	0.510	1	0.463
Gender difference	.000	1	0.982
Population cohort	35.410	2	0.000
Etiology of Anaemia	43.024	6	0.000
Prevalence of Anaemia	16.523	1	0.000
Severity of Anaemia	131.904	3	0.000

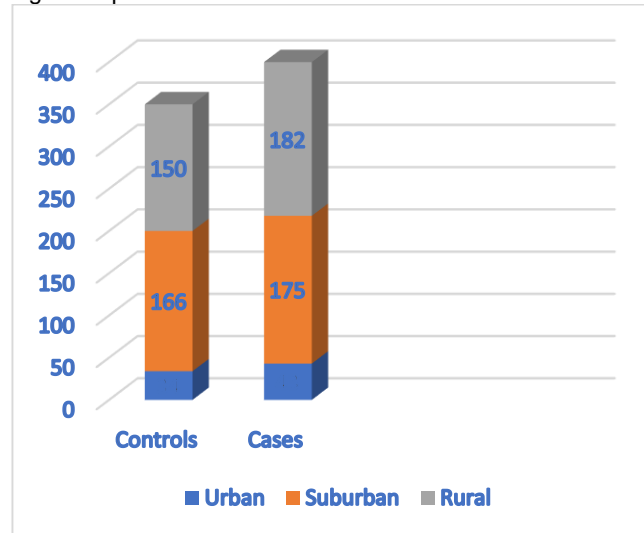Fig. 1: Population cohort

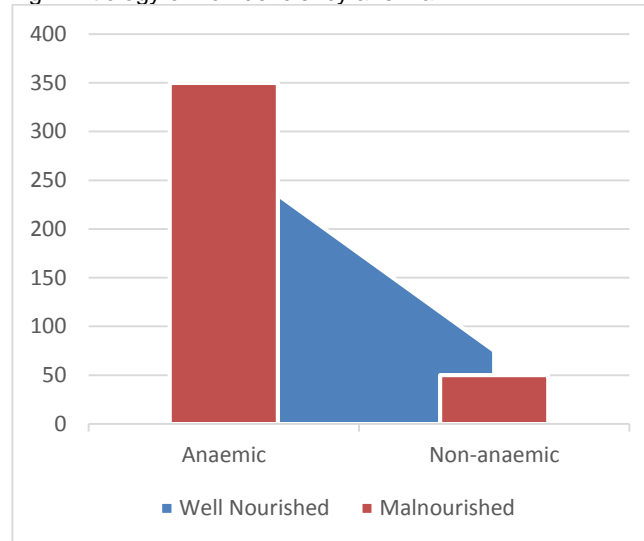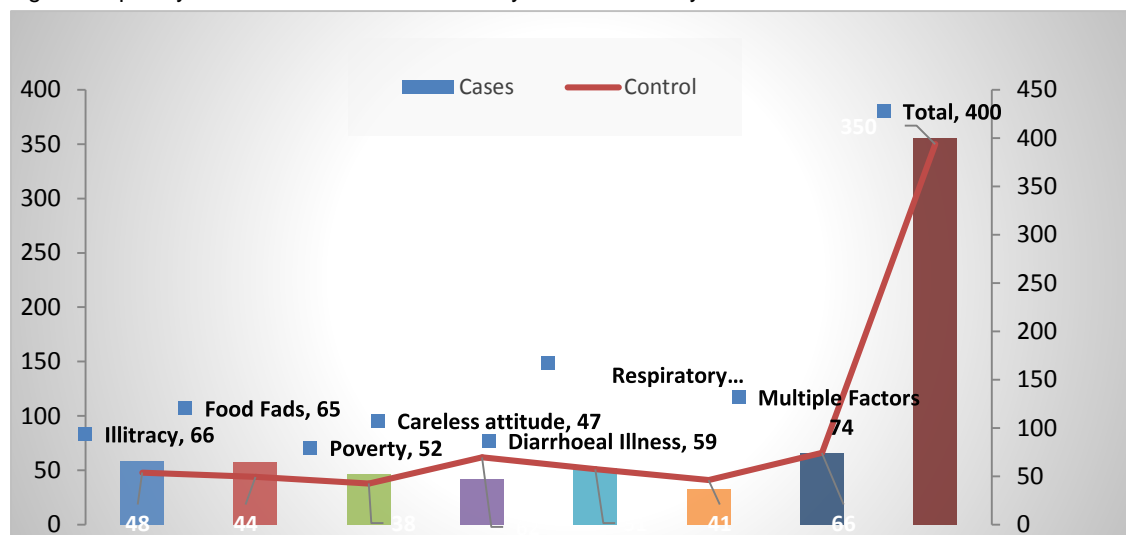Fig:2: Etiology of Iron deficiency anemia

Fig: 3 Frequency &Distribution of Iron Deficiency anemia in Study cohort

DISCUSSION

Statistical analysis of this study revealed that difference in age and gender were not significant. The differences in etiology, frequency of anemia as for population cohort is concerned were statistically significant. Our results also showed that iron deficiency anemia is as common in well-nourished groups as in malnourished groups. Although mild IDA was more common in well-nourished group but moderate to severe IDA was more common in malnourished group.

Common factors identified as etiological factors were poverty, illiteracy, maternal food fads and careless attitude in both well-nourished and malnourished groups. Studies also showed that malnutrition is associated with iron deficiency anemia (IDA). Toddlers who are overweight and not in day care are at high risk for iron deficiency[16]. Research also suggest an association between child level food insecurity and iron deficiency anemia, a clinically important health indicator with known negative cognitive, behavioral and health consequences. In children with some degree of malnutrition, there is a calorie and protein deficiency in addition to the mineral deficiency[4]. The results of our study are same as in above mentioned study.

In view of significant impact of iron deficiency anemia on neurodevelopment and immune system, a national wide programme of iron fortification should be implemented. Iron-deficient children can certainly benefit[17]. Population-based interventions can efficiently and effectively reduce anemia and practically eliminate iron deficiency anemia and moderate to heavy soil transmitted helminth infections, maintaining them below the level of public health concern[1]. In children daily iron supplementation effectively reduces anaemia. However, the adverse effects of iron supplements and especially on development and growth are uncertain[3].

CONCLUSION

The results of this study showed thatiron deficiency anaemia is common health problem in children. Malnourished children are more likely to suffer from moderate to severe anaemia and its effects on neurodevelopment were having moderate to severe iron deficiency anaemia. Poverty, illiteracy, maternal food fads, careless attitude and multiple factors were most common underlying reasons for iron deficiency anaemia.

Recommendations: It is recommended that iron supplementation should be provided to children at school or Basic health unit to prevent iron deficiency (IDA).

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