PROFILE OF ANAEMIA IN SEVERE ACUTE MALNUTRITION CHILDREN AGED BETWEEN 6MONTHS TO 60 MONTHS IN PERIPHERAL INSTITUTE OF HIMACHAL PRADESH

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Abstract: Malnutrition, defined as underweight, is a serious public-health problem that has been linked to a substantial increase in the risk of mortality and morbidity. Severe acute malnutrition affects nearly 20 million preschool-age children mostly from the African Region and South-East Asia Region. Severe anaemia is a leading cause of paediatric morbidity, hospitalization, and mortality and also a very important co morbidity in children with severe acute malnutrition. Severe Acute Malnutrition (SAM) with anaemia has 2.62 times higher mortality as compared to SAM with no anaemia. So this study was meant to evaluate this co-morbidity further.

Key words: Anaemia, Malnutrition, Microcytic hypochromic

Introduction

Malnutrition is India's silent crisis that contributes the highest rates of child malnutrition and mortality in under-5 children in the world (twice that of sub-Saharan Africa) [1]. According to WHO estimates, India is one of the countries which has highest prevalence of anaemia. As per the National Family Health Survey (NFHS), there has been a decrease in prevalence of anaemia from 69.4%[1] to 58.4% (NFHS 4, 2015-2016)[2] among children between 6-59 months but is still a major social and medical problem. Severe Acute Malnutrition (SAM) with anaemia has been shown to have higher mortality as compared to SAM with no anaemia[3, 4]. As per NFHS 3, the prevalence of anemia in India is highest (79.7%–84.5%) in the 6- to 24-months age group [5].Not many studies have been conducted to evaluate this co morbidity of SAM and hence this study was done for analysis of types of anaemia and its severity in severe acute malnutrition children.

Methods

The study was a prospective study, conducted at Civil Hospital Jwalamukhi District Kangra Himachal Pradesh. All consecutive children aged between 6 month and 60 months hospitalized in hospital with severe acute malnutrition were included in the study after informed consent from the guardian. A total of 50children aged 6 to 59 months with a diagnosis of SAM were included in the study as cases. In the present study consecutive sampling was done among the admitted patients from the hospital. Children with primary haematological disease were excluded from the study. Using standard methods, a single observer measured children's weight, height/length, head and mid-arm circumferences. Venous blood of child was drawn under aseptic precautions after due consent from guardian. Auto analysers were used to measure blood counts. Blood smear was analysed by pathology consultant of one lab and recorded for all patients with anaemia.

Definitions used for the study were:

1. Severe acute malnutrition (SAM): Defined by low weight-for-height/ length (Z score <- 3 SD of median WHO child growth standards), a mid-upper arm circumference < 115 mm, or presence of bilateral pitting edema [6].

2. Anaemia: WHO's criterion for anaemia in children ages 6 month to 59 months with haemoglobin (Hb) levels < 11 g/dL.

Morphologic classification of anaemia:
Anaemia was defined and classified based on cell size: Mean corpuscular volume (MCV) and amount of Hb 5.
1. MCV less than -2SD of normal for that age: microcytic anaemia.
2. MCV within normal range: Normocytic anaemia.
3. MCV greater than -2SD of normal for that age: macrocytic anaemia
4. Dimorphic anaemia: When two or more causes of anaemia (microcytic and macrocytic) act simultaneously
Classification of anaemia based on haemoglobin levels[7]
1. Mild anaemia: 10-10.9 g/dL
2. Moderate anaemia: 7-9.9 g/dL
3. Severe anaemia: <7 g/dL

Statistical analysis: Data were entered in Excel spreadsheets and analysed using SPSS 20.0. Qualitative variables were compared using chi square test and quantitative variables were examined using student t-test. Mean values of quantitative variables were studied.

Results

In our study total of 50 patients with severe acute malnutrition were studied in which 28 were males and 22 were female. The mean age in the children was 20.7±11.5 months. Mean Haemoglobin levels were 7.2±1.56gm%. All children had some degree of anaemia in study.22 children were having severe anaemia Hb<7gm% and 26 children were detected with moderate anaemia Hb 7-9.9gm%.Only two patients were seen with mild anaemia. Microcytic hypochromic type was the type which was contributed by 30 (60%) cases. Macrocytic type of blood picture was seen with 12(24%) children and dimorphic picture was seen in 8 (16%) cases. The Results are given in tabular form in Table1 and Table 2.

Table1: **Classification of anaemia**

Severity of anaemia	No. of cases	Percentage
Severe anaemia <7gm%	22	44%
Moderate 7-9.9gm%	26	52%
Mild 10-10.9gm%	2	4%
No anaemia >11gm%	0	0%

Table 2: Peripheral smear (n=50)

Peripheral smear	Count (%)
Dimorphic anemia	8 (16.00)
Microcytic hypochromic anemia	30 (60.00)
Macrocytic anemia	12 (24%.00)

Discussion

Anaemia is a major morbidity associated with severe acute malnutrition. As per the operational guidelines on SAM, nearly 70% of children (6–59 months) with SAM have anaemia. Out of which, 26% mild anaemia, 40% moderate anaemia, and 3% severe anaemia[8]. In our study, all of children with severe acute malnutrition aged between 6months to 60 months were found to be anaemic with varying degree. Majority of SAM children had moderate anaemia (52%).Most common type of anaemia in cases was microcytic hypochromic (60%) followed by macrocytic type (24%). This finding was in accordance of previous studies where studies have shown microcytosis[9, 10]. A study done by Thakur et al. found 38.6% cases with microcytic hypochromic blood picture while 30.5% with megaloblastic anemia ,27.7% with normocytic normochromic and 3.2% cases had dimorphic blood picture which meant that microcytic hypochromic is the leading finding followed by megaloblastic type [11]. Which was also reported by our study. The main type of anaemia in operational guidelines for SAM management had stress on treating microcytic anaemia[8] which was the most encountered type of anaemia in our study.

Conclusion: This study emphasises the fact that anaemia is present in all severely malnourished children with although different severity and microcytic hypochromic anaemia followed by macrocytic anaemia are most common variant in this population

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