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SEVERE ANAEMIA;

AWARENESS AND THE RISK FACTORS OF SEVERE ANAEMIA AMONGST CHILDREN 7 MONTHS - 5 YEARS OF AGE

Mazhar Nazir Chattha[1], Muhammad Idris Mazhar[2], Taqi Hasan[3], Manzoor Elahi Rai[4], Kashif Waqas[5]

1. MBBS, FCPS (Paeds), Associate Professor of Paediatrics, Islam Medical College.
2. MBBS, MCPS, FCPS (Paeds), Assistant Professor of Paediatrics, Islam Medical College.
3. MBBS, MCPS, FCPS (Paeds), Consultant Paediatrician, CMH Sialkot.
4. MBBS, MCPS, FCPS (Paeds), HOD, Professor of Paediatrics, Islam Medical College.
5. MBBS, DCPATH, M. Phil. (Microbiology) HOD, Assistant Professor Department of Pathology, Sialkot College of Physical Therapy, Sialkot.

Correspondence Address:
Dr. Mazhar Nazir Chattha
Associate Professor of Paediatrics,
Islam Medical College.
dr.m.n.chattha@gmail.com

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ABSTRACT: Anaemia is common reason of morbidity and mortality in children especially in third world countries. 300 million children had anaemia globally in 2011. Nutritional IDA (iron deficiency anemia) is a most common anaemia especially in children as well as women.[1] Severe anaemia was present in 5.4% of anaemic children (62.1%) in national nutritional survey 2011.[1] Iron deficiency anaemia (IDA) is also a most common cause of childhood anaemia in Pakistan. Factors causing anaemia are multiple including poverty, illiteracy and poor dietary habits. **Objective:** To know about the awareness of severe anaemia in children by their parents and effect of various risk factors causing severe anaemia. **Study Design:** Prospective cross sectional study. **Setting:** Paediatric OPD Islam Teaching Hospital, Sialkot. **Period:** Jan 2016 to June 2017. **Methods:** Children who came to paediatric OPD of Islam Teaching Hospital, having pallor were investigated for level of haemoglobin (Hb). Those included in this study were having Hb% < 7 gm/dl and parents were interviewed according to a questionnaire. **Results:** Only 23% of parents were aware of anaemia in their children. Inadequate or no weaning was seen in 95% of patients. 26% of children were underweight, had weight for age (WAZ) score less than -2 according to WHO standards. 83% of mothers were educated up to matric. All the children had markedly low mean corpuscular volume (MCV). 72% of children were 24 months old or below. 80% of children were taking cows/buffalos milk. **Conclusion:** Age less than 24 months, poor socioeconomic status, lower education qualification of mother, poor weaning habits were associated with increased chances of severe anaemia and parents had poor awareness of pallor/anaemia in children.

Key words: Awareness of Severe Anaemia, Children Under Five, Risk Factors for Severe Anaemia, Sialkot.

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INTRODUCTION

Prevalence of anaemia has decreased globally in children ranging between 6 months to 5 years of age from 47% in 1995 to 43% in 2011. Similarly severe anaemia has decreased from 3.5% to 1.7% globally during the same period. In high income regions prevalence of anaemia and severe anaemia is 11% and 0.1% respectively. Prevalence of anaemia is 58% and severe anaemia is 2.1% in South Asia region in which Pakistan is present, while it is still higher in African region.[1] Anaemia mostly occurs in underdeveloped as well as developing countries. When incidence of anaemia is > 40% it is regarded "severe" public health problem by WHO.[2] Severe anaemia was present in 5.4% and anaemia was present in 62.1%of preschool children in national nutritional survey Pakistan 2011.[3] For Pakistan, anaemia is the severe public health problem. Most of it was due to iron deficiency. Iron is a critical component of enzymes, cytochromes, myoglobin and haemoglobin.[4] Iron deficiency in addition to causing anaemia also leads to decreased alertness and impaired neurocognitive function which may be permanent. These children are usually irritable with poor appetite. Illiteracy, poverty, poor feeding habits and social taboos are some of the causes. This nutritional deficiency of iron develops gradually, giving compensatory mechanisms to act and set off the effects of anaemia until it is severe, so the parents often miss the pallor. Parents miss the pallor even when

haemoglobin is below 7 gm/dl. Iron deficiency anaemia is accompanied by anorexia resulting in malnutrition and further setting in the vicious cycle.

OBJECTIVES

To study the awareness of severe anaemia in children by their parents and its relationship to age, malnutrition, weaning, anorexia, education of mother and socioeconomic status. Mild anaemia may be missed by the parents so only severe anaemia was selected as it is unlikely to be missed by parents. More over severe anaemia is related to increased morbidity and mortality. Awareness of pallor/anaemia was given importance because to take remedial steps, one must recognize the problem first.

METHODS

It was a prospective study carried out in paediatric OPD Islam Teaching Hospital, Sialkot from Jan 2016 to June 2017. Children aged 7 months to 60 months old visiting paediatric OPD and having pallor underwent complete blood count. Complete blood count was done on Sysmex KX 21 automatic haematology analyser. Severe anaemia was labeled when Hb was <7 gm/dl as according to WHO standard.[5] Those children whose Hb% was < 7 gm/dl were included in the study. The written consent were obtained from parents. Children with chronic illness, cerebral palsy, known haemolytic anaemias and significant hepatosplenomegaly were not included in the study. Data collection was according to questionnaire. Results obtained were entered and analyzed by SPSS 21.

RESULTS

There were 100 children included in this study who had Hb < 7 gm/dl. 74% were male and 26% were female. 61% had Hb between 6 to 6.9 gm/dl. Mean Hb was 6.078 $\pm$ 0 .685. 72% of children were 7 to 24 months old. Mean age was 23.34 $\pm$11.96. Most of them (85%) came from rural area. Only 23% parents were aware that their children were suffering from anaemia. All the children had low MCV. Mean MCV was 52.8$\pm$ 3.2. Educational status of most (83%) of the mothers were matric or below. Inadequate weaning and no weaning at all were seen in 77% and 18% of children respectively. Adequate weaning was seen in only 5% of the children. All children above 12 months (79%) were taking cow's milk as well as 10 children who were below 12 months. Poor appetite/anorexia was seen in 79% of children. 74% of children had weight for age (WAZ) score above -2, rest 26% were under weight with 21% had WAZ score below -2 and 5% had WAZ below -3 of WHO standard. 52% of families had monthly income less than Rs 20000 and 28% had between Rs 20000 to 30000. All anaemic children were advised oral ferrous sulphate solution. 30% children came for follow up and all had increase in their Hb as well as improvement in their appetite and activities. 15% had history of picca.

Age in Months	No. of Children (%)
6-12	22 (22)
13-24	50 (50)
25-36	18 (18)
37-48	7 (7)
49-60	3 (3)

Number of children with respect to age having severe anaemia.

Haemoglobin Level (gm/dl)	No. of Children (%)
4-4.9	8 (8)
5-5.9	31 (31)
6-6.9	61 (61)

Number of children with respect to haemoglobin level

Educational Level	No. of Children (%)
Illiterate	1 (1)
Primary	14 (14)
Middle	32 (32)
Metric	36 (36)
Intermediate	8 (8)
Bachelor	5 (5)
Masters	4 (4)

Educational qualification of mother

DISCUSSION

A common problem in all the developing and underdeveloped countries is anaemia. It also holds true for Pakistani population especially children under 5 years. According to WHO 300 million children had anemia worldwide in 2011 which constitutes 43% of world children under five.

Anaemia was present in 62.1% of age up to 5 years children in the national nutritional survey 2011. 5% of children had severe anaemia. The percentage of anaemia was 60 in Punjab while lowest percentage was 40.4 in Gilgit Baltistan. 43.8% of children had low serum ferritin. 4.1% children were found to be severely anaemic in the secondary analysis done by Habib et al on the national nutritional survey Pakistan 2011-12.[1]662.3% were found to be anaemic and 47.1% were having low serum ferritin. In younger children of < 2 years age, severe anaemia was existent in 5% of the anaemic children while 90% had anaemia in semi urban area of Peshawar.[7]

In spite of the fact that in our study children having severe anaemia only were included, only 23% of parents were aware that that their children were suffering from anaemia not to talk of awareness regarding severity of anaemia. Studies on awareness of parents regarding pallor/anaemia are limited.

Globally 1.7% are effected by severe anaemia is. In a study in northern Ethiopia anaemia was present in 37.3% and severe anaemia 0.4% of children.[8] In south western Nepal prevalence of anaemia was 28.82% while severe anaemia was 11.6% of the anaemic patients under five years of age.[9]

Severe anaemia was present in 74% of boys as compared to girls. This significant difference in may be due to social trend of males being given priority. Boys are more effected with severe anaemia was also found in rural china.[10] 95%(140/148) of the boys had anaemia as compared to girls which was 85%(108/123).[7]

Lower educational status of mothers is associated with increased chances of anaemia. In our study educational status of 83% of the mothers was matric and below, while 47% were middle and below. Lower educational level is associated with an augmented chance of iron deficiency anaemia in a Malaysian study.[11]

85% of patients with severe anaemia came from rural area. This is due to the fact Islam Teaching Hospital is located 12 km from city centre with most of population coming from rural area. Severe anaemia was more prevalent in rural areas than urban areas 5.5% vs 3.6% respectively.[3] Anaemia was more common in rural areas of Bangladesh as compared to urban.[12] In Nigeria, anaemia was more common in rural area as compared to urban area i.e. 78.7% and 62% respectively area.[13]

Iron deficiency anaemia is more common in 9 months to 2 years old age group. In our study, 72% of children were up to 24 months of age. In a study in Nigeria, 63% of children less than 60 months suffering from severe anaemia were less than 24 months old.[14] In another study in Nigeria severe anaemia was 6% in 48-60 months age group as compared to 05 children in 12 -23 months. Severe anaemia at later age may be due to increased malarial infection. In a study in rural western china severe anaemia was more common in age group 6 to 23 months and was more than 3%.[10] Similarly anaemia is more common below 24 months of age in Haiti.[15] In a study in hospitalized children in Karnatka, India severe anaemia was 3.02% in 6 to 12 month old infant as well as 3.17% in second and third year of life.[16] Anaemia in age group 6 to 23 months was twice as compared to children 24 to 59 months old in a study in Bangladesh.[12]

Although malnutrition is associated with increased chances of anaemia, 26% of children were underweight, had WAZ (weight for age) score less than -2 as according to the WHO standards in this study. This is unlike in other studies in which malnutrition is associated with increased chances of anaemia. It may be due to the fact that 85% of children were coming from rural area where they had increased access to vegetables, cereals and fresh milk providing them adequate calories but deficient in iron. Fresh milk is relatively economical and more available in rural areas. More over there is myth that milk is sufficient to provide all the necessary calories and nutrients even if the child is not taking semisolids in rural areas. 89% of children were taking fresh milk including 10 infants. In developed countries excessive intake of cow milk during infancy is associated with the iron deficiency anaemia.[17] In a study in Iceland

children who were taking >500 ml of fresh milk 50% were iron deficient as compared to 1 child in 58 was iron deficient who were consuming milk < 500 ml in 2 year old children.[18] In our study 42% of children were started with breast feeding and later shifted to bottle feeding with fresh milk. 11% were taking breast feed along with fresh milk.

Inadequate weaning or no weaning at all, both combined were seen in 95% of children in our study. Adequate weaning was seen in only 5%. Poor weaning is associated with iron deficiency anaemia. Dietary deficiency leads to increased chances of microcytic anaemia.[19] Poor food diversity is associated with increased chances of anaemia as observed in a study in Ethopia.[20]

Markedly low MCV (mean 52.8+/-3.2) was seen in 100% of children in our study which was not seen in other studies. 37.5 % of the children with anaemia in Tanzania had microcytic hypochromic picture.[21]

Decreased appetite was seen in 79% of patients, a feature consistent with iron deficiency.

Chances of anaemia are increased with lower socio economic status. In our study 80% of children belonged to low socioeconomic class. In Karak, KPK, anaemia was more common in lower socioeconomic group in school going children.[22] Living in poor household was associated with increased chances of anaemia and severe anaemia in Malawi.[23] Similarly studies done in other countries also revealed increased anaemia and severe anaemia in lower socioeconomic families.[8,11,20]

CONCLUSION

Awareness regarding anaemia is poor in parents of children having severe anaemia. Lower education of mother, lower socioeconomic level, poor weaning, age less than 2 years and poor awareness of pallor/anaemia in children is associated with an amplified chance of severe in anaemia in children up to an age of 5 years.

RECOMMENDATION

It is recommended that the vaccinator should be trained to recognize pallor so that when children come for measles vaccination at 9 and 15 months, anaemic children should be recognized and referred to the paediatrician. Moreover lady health workers as well as doctors should look for pallor whenever child visits them and encourage addition of semisolids to the diet after 6 months of age.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Mazhar Nazir Chattha	Conception of design and acquisition of data.	
2	M. Idris Mazhar	Data analysis and discussion.	
3	Taqi Hasan	Discussion.	
4	Manzoor Elahi Rai	Overall supervision.	
5	Kashif Waqas	Liboratory and plagiarism.	