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PREVALENCE AND RISK FACTORS OF IRON DEFICIENCY ANEMIA IN CHILDREN BELOW 10 YEARS OF AGE AT DHQ HOSPITAL DERA GHAZI KHAN PUNJAB, PAKISTAN

[1]Kousar Naureen, [2]Shumaila Naz, [3]Tahira Shaheen

[1]Public Health Supervisor, College of Nursing District Headquarters Hospital Rajanpur, Punjab, Pakistan, Email ID: kousarnaureen@gmail.com

[2]Charge Nurse, District Headquarters Hospital Rajanpur, Punjab, Pakistan
Email ID: shumailkhan5541@gmail.com

[3]Principal, College of Nursing District Headquarters Hospital Rajanpur, Punjab, Pakistan
Email ID: ushnahamna@gmail.com

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Abstract:

Introduction: *Anemia is a common medical finding among children. In Pakistan, the prevalence of iron deficiency anemia is around 40-70% under 10 years of age. Anemia not only alters normal physical development but also impairs cognition and endurance in children. The aim of this study is to assess the prevalence and risk factors of iron deficiency anemia in children under 10 years of age presenting to DHQ Dera Ghazi Khan Punjab Pakistan.* ***Materials and Methods:*** *A total of 100 children were enrolled through a purposive random sampling presenting to the Pediatrics ward of DHQ Hospital Dera Ghazi Khan Punjab, Pakistan fulfilling the operational definition and admission criteria during July 2022 to November 2022. Hb level below 11gm/dl) was termed as anemia and further classified into microcytic, normocytic or macrocytic on peripheral blood film. Further testing for serum ferritin, hemoglobin electrophoresis, serum C-reactive protein and stool microscopy was advised to establish the definitive diagnosis. Risk factors were looked for in cases of iron deficiency anemia.* ***Results:*** *Among 100 enrolled children, 72 had anemia, among them 42 had iron deficiency anemia. Lack of financial resources and poor living standards was directly associated with the rate of anemia. Low for birth weight, preterm labor, bottle-feeding, under and non- breastfeeding, early and late weaning and non-recommended weaning diet were observed as important risk factors.* ***Conclusion:*** *Around 70 percent of the hospitalized children under 10 years of age were found to be anemic, among them around half of them were suffering from iron deficiency anemia. The findings of this study stresses upon the significance of evaluating the risk factors of anemia in children of school age group. Prompt awareness campaigns and revamping health education programs focusing mother and child health can serve as a valuable tool to manage this health problem in countries like Pakistan.*

Corresponding author:

Kousar Naureen,
Public Health Supervisor,
College of Nursing District Headquarters Hospital Rajanpur,
Punjab,Pakistan, Email ID: kousarnaureen@gmail.com

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INTRODUCTION:

Anemia commonly affects children under 2 years of age globally. According to an approximate the ratio of anemic under 4 years of age is high among the developing world 51% versus the 12% of the developed countries[1]. In Pakistan, the prevalence of iron deficiency anemia is around 40-70% under 10 years of age[2]. Anemia is basically caused by an under provision of the nutritional components for example deficiency of iron leads to microcytic anemia; whereas folic acid or vitamin B_{12} deficit is responsible for macrocytic picture[3,4].

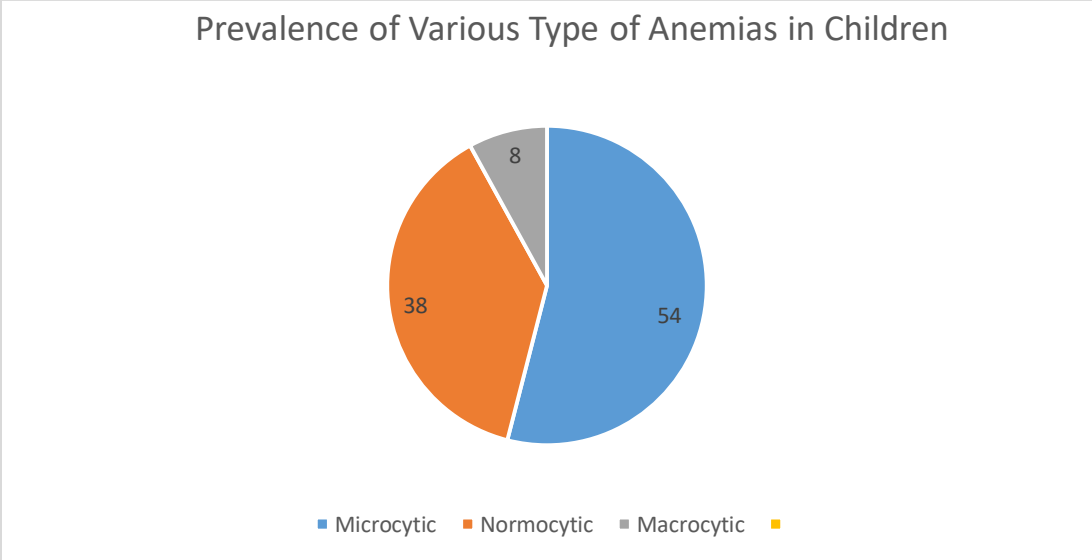
The dynamics of anemia in tropical world is versatile. It has been observed that infants who are reared on mother feed for more than 6 months without receiving iron rich supplements are more prone to develop iron deficiency anemia (IDA)[5,6]. Other contributing risks include birth weight <2.5kg, perinatal bleeds, extended weaning on cow-buffalo milk, parasitic infestations such as hookworms, pica syndrome and persistent diarrhea[7].

Iron deficiency anemia is one of the leading entity caused by nutritional deficiency in both the developing and developed world[3,8]. According to WHO, 43% of the children globally are suffering from iron deficiency anemia[1], while UNICEF has documented nearly two billion world population is suffering from anemia, the major bulk includes iron deficiency anemia, the children under 5 years of age and those living in the developing countries and [9].

Anemia not only affects the physical development but also undermines the higher mental functions, endurance and immunity of children having psycho-socioeconomic repercussions. Anemia is known to cause stunted growth and increased susceptibility towards infections because of the decline in both cell mediated and humeral immunity[3] [10], along with psychomotor and behavioral challenges [11,12]. Iron is vital for the physiological needs and maintaining the integrity of animal cells and is optimum immune responses. [13] Studies have revealed that iron deficient infants are more vulnerable to develop abnormally[14,15]. Thus it is imperative that children should undergo screening for anemia especially iron deficiency and risk factors stratification should be undertaken to prevent stunted growth and lifelong complications.

MATERIALS AND METHODS:

A total of 100 children were enrolled after formal approval and informed consent from the ethical review board and parents/guardians through a purposive random sampling presenting to the Pediatric ward of DHQ Hospital Dera Ghazi Khan Punjab, Pakistan fulfilling the operational definition and admission criteria during July 2022 to November 2022. Hb level below 11gm/dl) was termed as anemia and further classified into microcytic, normocytic or macrocytic on peripheral blood film. Further testing for serum ferritin, hemoglobin electrophoresis, serum C-reactive protein and stool microscopy was advised to establish the definitive diagnosis. Risk factors were looked for in cases of iron deficiency anemia. Confidentiality and privacy was maintained at all levels during the study. Data was analyzed by SPSS version 21. A P-value below 0.05 was considered statistically significant.



RESULTS:

Table.1 Distribution of common risk factors for the cause of anemia in children

n=100	Anemic (%age)	Non-Anemic (%age)	P-value
Birth Weight <2.5kg >2.5kg	62	38	0.02
Socioeconomic Status Poor (51) Lower Middle Class (29) Middle Class (14) Upper Middle Class (06)	 96 72 46 12	 04 28 54 88	0.015
Vaccinated? Yes (66) No (34)	 28 76	 72 24	
Exclusively Breastfed? Yes (67) No (33)	 06 96	 94 04	0.02
Early weaning (before 6 months of age)? Yes (72) No (28)	 70 30	 30 70	0.02
Late Weaning (after 6 months)? Yes (54) No (46)	 74 28	 26 72	0.03
History of parasitic worm infestation? Yes (52) No (48)	 92 10	 08 90	0.01
Prolonged rearing on cow's milk? Yes (64) No (36)	 82 24	 18 76	0.015
Mother's educational status? Yes (26) No (74)	 24 74	 76 26	<0.02

It is evident from the study that 62% of the low birth weight <2.5kg children had anemia. Similarly anemia was common among the poor segments of the society and improved with the better socioeconomic status e.g. 96%, 72%, 46%, 12% for the poor, lower middle class, middle class and upper middle classes respectively. 76% of the un-vaccinated subjects had anemia. 96% of the children who were not exclusively breastfed suffered from anemia. Early and late weaning affected the hemoglobin levels with 70 and 74% showed the symptoms of anemia respectively. 92% of the subjects who have had a history of parasitic worm infestation developed anemia later on. 82% of the children who were reared for prolonged periods on cow's milk suffered from low Hb. Similarly mothers educational status strongly impacted the incidence of anemia in children with 74% of the individuals having anemia whose mothers educational status was below primary level.

DISCUSSION:

Anemia puts serious liabilities on the immune system, physical growth and mental development leading to poor school performance and social wellbeing[20]. The prevalence of anemia is variable in different regions of the world

Numerous studies has shown the prevalence of anemia in children below 10 years of age of Pakistan lies between 40-70%. In this study, 72% of the study population had anemia which is similar to the findings of the National Surveillance Project (NSP) of Helen Keller International (HKI) which highlighted that fact that 68% of Bangladeshi children under 5 years of age was suffering from anemia (a similar resource country form the South Asia). The prevalence of anemia in Indian children of similar group was 74.3%. Nepal had 78% and Kazakhstan had 73.7% respectively[24]. This study cannot establish a relationship between gender and anemia which is contrary to a Bangladeshi study who found boys to be more anemic than girls[25].

The prevalence of microcytic anemia is high and comparable to other regions of the developing world for example South Benin, Africa (62%)[26] and Argentina (46%)[27]. This gradient can be presumed to be due to the iron deficit in nutritional supplies, parasitic worm infestation, prolonged rearing on unpasteurized cow's milk. On the contrary the prevalence of iron deficiency anemia is on the lower side in the developed countries for example United States (9%)[28], and European countries (7%)[29]. This steep is due to better living standards, fortified nutritional supplements and advance health delivery setups.[30]. This study endorses the fact that anemia is predominant in the resource limited countries. Majority (80%) of the children in our study also belonged to poor and lower middle class.
(Table 1).

Our study reflects that anemia is found to be directly associated with low for birth weight and preterm deliveries due to scanty iron reserves which are not replenished in the absence of breastfeeding and nutritional support within 6 months after birth [31], [32].

CONCLUSION:

Majority (72%) of the hospitalized children under 10 years of age were found to be anemic. Among all the case positive anemic iron deficiency was the predominant causative factor. This study highlights the significance of screening and assessing the risk factors of anemia in the vulnerable population and advocates the need to optimize the perinatal and nutritional support programs.

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