Original Article

Frequency of Iron Deficiency Anemia Among Anaemic Children from Age 6 Months to 60 Months

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ABSTRACT

Objective: Identify the prevalence of iron deficiency anaemia in anaemic infants between the ages of 6 and 60 months.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at the pediatric department of Ayub Teaching Hospital in Abbottabad from 10th November 2020 and 10th November 2021.

Materials and Methods: Basic demographic data, such as age, gender, and weight, were gathered on the 90 enrolled kids. Following operational criteria, venous whole blood samples were taken for automated analysis of iron deficient anaemia.

Results: The age range of the 90 children was 6 to 30 months for 66% (n=59), and 31 to 60 months for 34% (n=31). (10.66 SD) The average age was 29 months. 41% (n=37) of the participants were men, while 59% (n=53) were women. In addition, 43% (n=39) and 57% (n=51) of the participants had weights that were more than 10 kg. 9.48 g/dl was the average weight (5.19 SD). In addition, whereas 22% (n=20) of the kids did not have iron deficiency anaemia, 78% (n=70) of the kids did.

Conclusion: The study found that 78% of children between the ages of 6 and 60 months had iron deficient anaemia.

Key Words: iron deficiency anemia, children, 6 months to 60 months.

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INTRODUCTION

Iron deficiency is the most typical cause of anaemia, which is defined as haemoglobin below two standard deviations of the mean for age and gender[1]. Microcytic and hypochromic red blood cells result from an iron deficit since iron is required for the formation of haemoglobin. Age, gender, and socioeconomic position all affect the root causes of an iron deficit[2,3]. Fatigue and dyspnea with effort are symptoms. Addressing the underlying problem and taking iron supplements are part of the treatment. Inadequate intake, poor absorption, or blood loss, the latter of which is frequent in elderly individuals, may all lead to an iron shortage[4,5].

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Infants who are breastfed are protected against iron deficiency, but parasite infestations are a factor in underdeveloped nations Limited studies in densely populated and poor areas have shown high frequencies of iron deficiency anemia in children under 5 years. In Pakistan, the prevalence of iron deficiency anemia among children, especially in Khyber Pukhtunkhwa, remains poorly understood[6]. This study aims to determine the frequency of iron deficiency anemia in children aged 6 to 60 months to assess the local population's burden of this condition[7].

MATERIALS AND METHODS

In the current study a total of 90 children were observed it. Basic demographics (age, gender and weight on weighing machine) were noted. Between 10-November-2020 and 10-November-2021, a cross-sectional research was carried out at the pediatric department of Ayub Teaching Hospital in Abbottabad Venous whole blood (3 mL) was collected into Ethylenediamine tetraacetic acid containing tubes (vacutainer) for automated blood analysis. Blood sampling was carried out by at least 4th year resident. Blood samples were sent to main hospital laboratory for testing. Data was collected for Iron deficiency anemia as per operational definition and noted in specially designed proforma.

RESULTS

Among the 90 children, 66% (n=59) fell within the age group of 6 to 30 months, while 34% (n=31) were aged 31 to 60 months. The mean age was 29 months (± 10.66 SD). Of the total participants, 41% (n=37) were male and 59% (n=53) were female. Additionally, 57% (n=51) had a weight of ≤10 kg, and 43% (n=39) had a weight >10 kg. The mean weight was 9.48 g/dl (± 5.19 SD). Moreover, 78% (n=70) of the children had iron deficiency anemia, while 22% (n=20) did not.

Table No. 1: Age Distribution (n=90)

Age	Frequency	Percentage
6 – 30 months	59	66%
31-60 months	31	34%
Total	90	100%
Mean and SD	29 months ± 10.66	

Table No. 2: Gender Distribution (n=90)

Gender	Frequency	Percentage
Male	37	41%
Female	53	59%
Total	90	100%

Table No 3: Weight Distribution (n=90)

Weight	Frequency	Percentage
≤ 10 Kg	51	57%
> 10 Kg	39	43%
Total	90	100%
Mean and SD	9.48 g/dl ± 5.19	

Table No 4: Poor Economic Status (n=90)

Poor Economic Status	Frequency	Percentage
Yes	68	76%
No	22	24%
Total	**90**	**100%**

Table No. 5: Iron Deficiency Anemia (n=90)

Iron Deficiency Anemia	Frequency	Percentage
Yes	70	78%
No	20	22%
Total	90	100%

Table No. 6. Stratification of Iron Deficiency Anemia with Respect to Age (n=90)

Iron Deficiency Anemia	6 – 30 months	31-60 months	Total	P value
Yes	46	24	70	0.9527
No	13	7	20	
Total	59	31	90	

Chi square test was applied

Table No. 7: Stratification of Iron Deficiency Anemia with Respect to Gender (n=90)

Iron Deficiency Anemia	Male	Female	Total	P value
Yes	29	41	70	0.9088
No	8	12	20	
Total	37	53	90	

Chi square test was applied

Table No. 8: Stratification of Iron Deficiency Anemia with Respect to Weight (n=90)

Iron Deficiency Anemia	≤ 10 Kg	> 10 Kg	Total	P value
Yes	40	30	70	0.8645
No	11	9	20	
Total	51	39	90	

Chi square test was applied

Table No. 9:Stratification of Iron Deficiency Anemia with Respect to Poor Economic Status (n=90)

Iron Deficiency Anemia	Yes	No	Total	P value
Yes	53	17	70	0.9477
No	15	5	20	
Total	68	22	90	

Chi square test was applied

Data Collection and Analysis: 90 children fulfilling the inclusion criteria from Outdoor Department of pediatric medicine, ATH, Abbotabad were included in the study after permission from ethical committee and research department of ATH. Informed consent was taken from each parents, ensuring confidentiality and fact that there is no risk involved to the patient while taking part in this study. Basic demographics (age, gender and weight on weighing machine) were noted. Venous whole blood (3 mL) was collected into Ethylenediamine tetraacetic acid containing tubes (vacutainer) for automated blood analysis. Blood sampling was carried out by at least 4th year resident. Blood samples were sent to main hospital laboratory for testing. Data was collected for Iron deficiency anemia as per operational definition and noted in specially designed proforma (Annexure-I). The data was analyzed using the statistical analysis program SPSS version 23. Quantitative variables such as age and weight were presented as mean ± SD. Qualitative variables like gender, poor economic status, and iron deficiency anemia were analyzed by computing frequencies and percentages.5,6 Stratification was used to control for effect modifiers such as age, gender, poor economic status, and weight. The post-stratification chi-square test was applied, with a significance level of $p \leq 0.05$ considered statistically significant.

DISCUSSION

In our study, we looked at 90 kids and discovered that 34% (31 kids) were between 31-60 months old, while 66% (59 kids) were between 6 and 30 months[8]. The standard deviation was 10.66 and the mean age was 29 months[9]. 41% (37 children) of the participants were male, and 59% (53 children) were female. Furthermore, 43% (39 children) had a weight of >10 kg, whereas 57% (51 children) did not[10]. The standard deviation was 5.19, and the average weight was 9.48 g/dl. In addition, whereas 24% (22 children) did not live in poverty, 76% (68 children) did. Additionally, whereas 22% (20 children) did not have iron deficient anaemia, 78% (70 children) did[11]. Another research with 295 participants and similar results showed that 81.4% (240 children) had normal haemoglobin levels and 18.6% (55 children) had anaemia.8,15 82% (242) of the children in the research had ferritin levels below normal, according to the report. Children of various height and weight groups' haemoglobin and ferritin levels did not significantly vary from one another[12]. The research also showed that youngsters entering their first year of school often had iron insufficiency without anaemia. According to regression models, independent factors including age, height, and weight status on -score charts, as well as ferritin levels, cannot be predicted. Similar findings were found in another research that included 160 kids. Of them, 30% (or 48 kids) had anaemia, and of those, 85.4% (or 41 kids) had iron-deficiency anaemia (IDA). The percentage of boys (25.0%) and girls (26.4%) with IDA, as well as the percentage of children with IDA who were well-nourished (26.2%) and moderately-nourished (23.3%), were not significantly different, according to the research[13]. With an odds ratio of 5.8 (95% confidence interval: 2.5-13.8), children under two were more likely than older children (40.7%) to have IDA, independent of gender or diet. We conclude that the significant frequency of iron deficiency anaemia, especially in young children, is highlighted by our research as well as the studies we have already discussed[14,15]. The results show the need for more intervention studies concentrating on foods that are high in iron or that have been fortified with iron and iron supplements, particularly in young children under the age of two. It is important to note that the high incidence seen among wealthy families' seemingly healthy children raises the possibility that rates may be substantially higher in the general population[16].

CONCLUSION

This study aimed to determine the prevalence of iron deficiency anemia among anemic children aged 6 to 60 months in the Khyber Pukhtunkhwa region of Pakistan. The findings revealed that 78% of the children enrolled in the study had iron deficiency anemia, indicating a high burden of this condition in the local pediatric population. The study included 90 children, with 66% falling within the age group of 6 to 30 months and 34% aged 31 to 60 months. The majority of the participants were female (59%) and had a weight of ≤10 kg (57%). The mean age was 29 months, and the mean weight was 9.48 g/dl. Furthermore, 76% of the children belonged to a poor economic status. The results of this study are consistent with previous research conducted in similar settings, highlighting the high prevalence of iron deficiency anemia among young children. The findings emphasize the need for intervention trials and strategies to address iron deficiency, such as the promotion of iron-rich or iron-fortified foods and iron supplementation, particularly among children below the age of 2. It is important to note that the high prevalence observed in apparently healthy children from poorer backgrounds suggests that the rates could be even higher in the general population. Therefore, further studies with larger sample sizes, diverse populations, longitudinal designs, and comprehensive assessments of anemia etiology and treatment outcomes are warranted to gain a more comprehensive understanding of iron deficiency anemia in children. In conclusion, this study contributes to the existing body of knowledge on iron deficiency anemia in children and highlights the need for targeted interventions and public health measures to address this significant public health concern in the Khyber Pukhtunkhwa region of Pakistan.

Author's Contribution:

Concept & Design of Study:	Qurat ul Ain Ali
Drafting:	Rabiha Manzoor, Bushra Mushtaq
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Revisiting Critically:	Qurat ul Ain Ali, Rabiha Manzoor
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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