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FREQUENCY AND RISK FACTORS OF IRON DEFICIENCYANEMIA IN CHILDREN BELOW 10 YEARS OF AGE AT A TERTIARY CARE HOSPITAL PAKISTAN.

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Abstract

Introduction: In South Asia, anaemia affects more than 50% of preschool-aged kids due to its diverse aetiology. To successfully solve this issue, it is necessary to clarify the situationally reasons of anaemia. Anemia is a common medical finding among children. Anemia due to iron deficiency affects 40–70percent of the overall of kids less than the age of 10 in Pakistan. Anemia not only alters normal physical development but also impairs cognition and endurance in kids. Under this analysis, the frequency and risk markers of iron deficiency anaemia in kids below the age of 10 who visit PMCH Pakistan are evaluated. **Materials And Methods:** A total of 385 children were enrolled through a purposive random sampling presenting to the Pediatrics ward of PMCH, Pakistan fulfilling the operational definition and admission criteria during JANUARY 2021 to DECEMBER 2022. Hb level below 11gm/dlwas termed as anemia and anemia is 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:** Out of 385 patients there were total 210(54.54%) male and 175(45.46%) females. Mean age 5.2466, minimum 2 years and maximum 10 years. Out of 385 patients There were 152 with normocytic anemia, 216 microcytic anemia and 17 with macrocytic anemia. Out of 210 male patients There were 57 males with normocytic anemia, 146 microcytic anemia and 7 with macrocytic anemia. Out of 175 female patients There were 95 females with normocytic anemia, 70 microcytic anemia and 10 with macrocytic anemia.p value =0.05 **Conclusion:** Around 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. 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.

Keywords: South Asia, Anaemia, Children, Iron Deficiency Pakistan

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INTRODUCTION:

Children's anaemia (IDA) is a well-known healthcare problem which has a negative influence on mortality and morbidity among kids & hinders intellectual development. The most common kind of micronutrient insufficiency worldwide and a substantial health concern is iron deficiency anaemia in young infants. [1, 2]. Iron deficiency anaemia (IDA), which is defined as haemoglobin level of 110g/L and ferritin level of 12g/L, accounts for half of the prevalence of anaemia (defined as haemoglobin level of 110g/L) in children aged 6-59 months over the world. [1-4] Anemia commonly affects children below age of 02 years 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[5]. In Pakistan, the prevalence of iron deficiency anemia is around 40-70% under 10 years of age[6]. 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 B12 deficit is responsible for macrocytic picture[7,8]. 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)[9,10]. 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[11]. Iron deficiency anemia is one of the leading entity caused by nutritional deficiency in both the developing and developed world[7,12]. According to WHO, 43% of the children globally are suffering from iron deficiency anemia[5], 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 [13]. 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[7, 14], along with psychomotor and behavioral challenges [15,16]. Iron is vital for the physiological needs and maintaining the integrity of animal cells and is optimum immune responses. [17] Studies have revealed that iron deficient infants are more vulnerable to develop

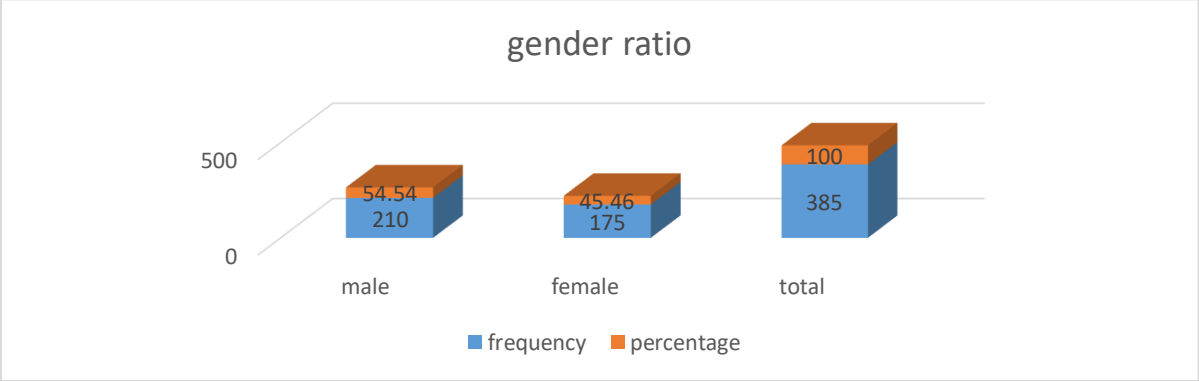
abnormally[18,19]. Thus it is imperative that children should undergo screening for anemia especially irons deficiency and risk factors stratification should be undertaken to prevent stunted growth and lifelong complications. Data on the real frequency and determinants of IDA in Pakistan is scarce. This research looked on IDA in kids who were under the age of ten.

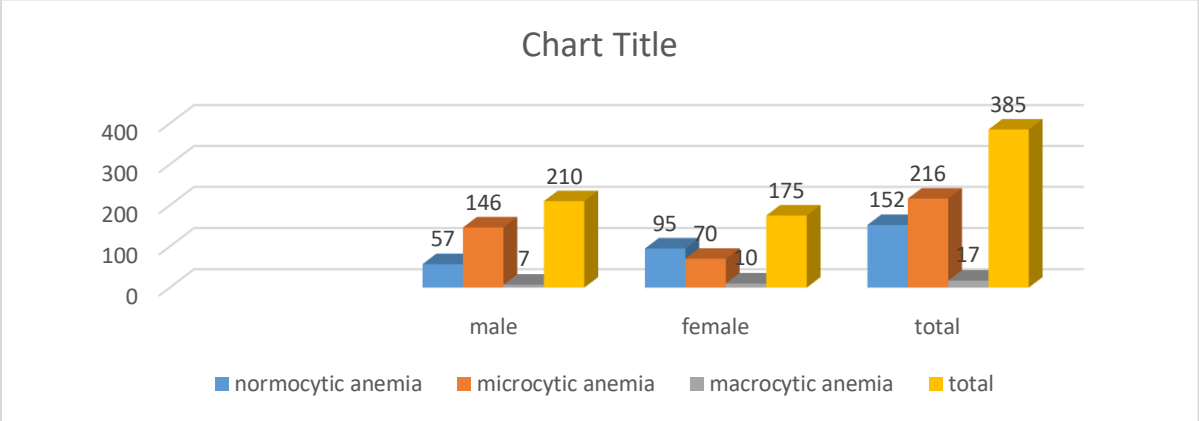
MATERIALS AND METHODS:

A total of 385 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 PMCH Pakistan fulfilling the operational definition and admission criteria during July 2022 to November 2022. In a peripheral blood smear, haemoglobin levels below 11 g/dl were referred to as anaemia as well as further categorised as microcytic, normocytic, or macrocytic. To make the conclusive diagnosis, additional screening for blood ferritin, haemoglobin electrophoresis, serum C-reactive protein, and stool microscopy was suggested. In cases of anaemia caused by a lack of iron, risk factors were investigated. Throughout the study, privacy and confidentiality were upheld at all times. SPSS version 21 was used to analyse the data. Statistical significance was defined as a P-value 0.05.

RESULTS:

Out of 385 patients There were total 210(54.54%) male and 175(45.46%) females. Mean age 5.2466, minimum 2 years and maximum 10 years.





Out of 385 patients There were 152 with normocytic anemia, 216 microcytic anemia and 17 with macrocytic anemia. Out of 210 male patients There were 57 males with normocytic anemia, 146 microcytic anemia and 7 with macrocytic anemia. Out of 175

female patients There were 95 females with normocytic anemia, 70 microcytic anemia and 10 with macrocytic anemia.p value =0.05 There were total; 210 male and 175 female patients, 170 were from urban while 215 were from rural areas. P=0.023, 260 patiets were from lower class while 116,9 from middle and upper class respectively. P=0.123. regarding educational status of mothers 105 were educated and 280 were uneducated p=0.005, there were 376 muslim and 9 non muslim patients p=0.222, in 376 patients there was positive history of breast feed while in 09 patints were not breast feed at all p=0.144. worm infestations was positive in 101 cases and negative in 284 cases p=0.001, history of marketed milk was positive in 293 and negative in 92 cases p=0.112. there was history of cow milk intake in 111, while negative in 274 cases p=0.045. lastly the there were 262 cases fully vaccinated and 123 were imcompletely or not vaccinated p=0.022.

		Normocytic Anemia	Microcytic Anemia	Macrocytic Anemia	Total	P value
Gender						
	Male	57	146	7	210	0.05
	Female	95	70	10	175	
	Total	152	216	17	385	
Address						0.023
	Urban	70	92	8	170	
	Rural	82	124	9	215	
	Total	152	216	17	385	
SE Status						0.123
	Lower Class	110	140	10	260	
	Middle Class	40	71	5	116	
	Upper Class	2	5	2	9	
	Total	152	216	17	385	
Education Of Mother						0.005
	Educated	60	40	5	105	
	Uneducated	192	176	12	280	
	Total	252	216	17	385	
Religion						0.222
	Muslim	150	210	16	376	
	Non Muslim	2	6	1	9	
	Total	152	216	17	385	
History Of Breast Feed						0.144
	Yes	130	180	7	317	
	No	22	36	10	68	
	Total	152	216	17	385	
Worm Infestion						0.001
	Yes	30	70	1	101	
	No	122	146	16	284	
	Total	152	216	17	385	
Marketed Milk						0.112

	Yes	110	170	13	293	
	No	42	46	4	92	
	Total	152	216	17	385	
H/O Cow Milk						0.045
	Yes	40	70	1	111	
	No	112	146	16	274	
	Total	152	216	17	385	
Vaccination						0.022
	Yes	110	140	12	262	
	No	42	76	5	123	
	Total	152	216	17	385	

Mean age 5.2466, minimum 2 years and maximum 10 years.

DISCUSSION:

The prevalence of anaemia was measured at the national and regional levels in this study, and the stability of the risk factors for anaemia in 10-year-old children was evaluated. IDA's frequency in our study Out of 385 patients, 152 had normocytic anaemia, 216 had microcytic anaemia, and 17 had macrocytic anaemia, which is much less than the estimate from a prior research in Pakistan and lower than earlier studies in other low-resource nations like Palestine and Kenya. [20,21,22] In the current study, worm infestations were positive in 101 instances and negative in 284 cases, with a p value of 0.001. These disparities may be explained by changes in the study settings or by factors like the rate of parasite illnesses and dietary patterns. The recently scientific article from Pakistan, that wasn't relevant to this inhabitants study, indicated a frequency of IDA of 63% from a lower proportion (n = 320) obtained from a semi-urban location. There were total; 210 male and 175 female patients, 170 were from urban while 215 were from rural areas. P=0.023. Also, it was carried out Eighteen decades back, prior to Pakistan's adoption of iron fortification [23].

Around 40 and 70 percent of kids younger than five in Pakistan are believed to have IDA 24]. IDA has indeed been linked to stunted growth, cognitive impairment, a reduction in physical activity, and it has been hypothesised as a factor in Pakistani children's high newborn death rates. [24, 25], Anemia puts serious liabilities on the immune system, physical growth and mental development leading to poor school performance and social wellbeing[26]. 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[27]. 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[28]. The prevalence of microcytic anemia is high and comparable to other regions of the developing world for example South Benin, Africa (62%)[29] and Argentina (46%)[30]. 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%)[31], and European countries (7%)[32]. This steep is due to better living standards, fortified nutritional supplements and advance health delivery setups.[33]. 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 01). Our study reflects that Out of 385 patients there were 152 with normocytic anemia, 216 microcytic anemia and 17 with macrocytic anemia. Out of 210 male patients there were 57 males with normocytic anemia, 146 microcytic anemia and 7 with macrocytic anemia. Out of 175 female patients There were 95 females with normocytic anemia, 70 microcytic anemia and 10 with macrocytic anemia.p value =0.05 anemia is found to be directly associated with low for diet and low socioeconomical class due to scanty iron reserves which are not replenished in the absence of breastfeeding and nutritional support within 6 months after birth [34], [35]. A common strategy to address child anemia has been to promote intake of foods rich in iron during the complementary feeding period [36, 37]

CONCLUSION:

The substantial impact of IDA amongst Pakistani children is significantly felt by the youngest and the most growth-retarded children. Exposed kids are additionally more inclined to still have moms having IDA and also to reside in areas with poor food availability. Either nearly vertical measures, like iron therapy, & straight horizontal programs, like wheat flour fortification, ought to be incorporated into government efforts to lessen the burden of IDA. Our study reflects that Out of 385 patients there were 152 with normocytic anemia, 216 microcytic anemia and 17 with macrocytic anemia. 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.

Ethics Approval: The ERC gave ethical review approval

Consent To Participate: written and verbal consent was taken from subjects and next of kin

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Authors' Contributions: All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

Conflict Of Interest: No competing interest declared.

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