

Prevalence Of Types Of Anemia In Pediatric Population – An Observational Study

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Abstract: Anemia is a very serious health problem in India and most common nutritional problems in many parts of the world. We estimated the different types of prevalence of anemia in children, an observational study. We collected data from 140 pediatric patients. The study had been conducted for six months and the required data was collected. We included 140 pediatric patients who are anemic irrespective of their gender and age. We documented the prevalence of different types of anemia, in which the iron deficiency is highly prevalent i.e., 37.85%. Our data shows that the mean age of the patients was 6.6 ± 4.1 years (range 1-15 years). It was found that 53 (37.8%) patients have iron deficiency anemia which is highly prevalent, 15 (10.7%) patients have sickle cell anemia, 26 (18.5%) patients have severe anemia and hemolytic anemia, 18 (12.8%) patients have β -Thalassemia minor and β -Thalassemia major, 10 (7.14%) patients have sickle cell thalassemia, 8 (5.7%) patients have thrombocytopenia, 6 (4.2%) patients have nutritional anemia, 3 (2.1%) patients have vitamin B12 deficiency and 1 (0.71%) patients have hemophilia-VIII factor. The present investigation might help the clinicians to initiate good treatment to reach the treatment goals. Thus, it is recommended that children should be monitored regularly to avoid complications and mortality.

Key Words: Anemia, Pediatrics, Iron deficiency anemia

I. Introduction

Anemia is a very serious health problem in India and most common nutritional problems in many parts of the world^[1]. In this the iron deficiency anemia and nutritional anemia is highly prevalent and most common in children and pregnant women globally. This is affecting the cognitive development, physical activity, immunity profile and growth mainly in children. Nutrition is the main underlying cause in recent years^[2]. Children caretakers are also main reasons for these consequences due to poor knowledge, economical status, sanitation and health. Along with nutritional and iron deficiency anemia the prevalence of thalassemia and hemolytic anemia are high and most common in Telangana district. Similarly infections like malaria, hook worm also plays an important role in prevalence of anemia in children. Consanguinity is one of the etiologies for any type of anemia, but mainly for thalassemia^[3].

Most possible causes of nutritional anemia and folate deficiency is due to neural tube defects, pregnancy adverse effects, cardiac problems, mental health. Vitamin B12 deficiency is caused by heart problems and neuropathy. Iron deficiency anemia is common among young children due to their diet which is less in iron. Other causes of anemia are gastric bleeding, chronic illness, decreased erythropoiesis, impaired bone health and unusual blood loss^[4]. Obesity is also one of the common factors in children and elder people. Obese people are at high risk of getting iron deficiency anemia because they take unbalanced meals i.e., food rich in carbohydrates and fat. The prevalence of iron deficiency anemia and obesity is high in people who take low-cost fast foods which are less in nutrients and more in sugars, preservatives and fats^[5].

The problem of getting anemia is more in less developed countries than the developed countries due to potential burden on people like their income, socio-economic status, less knowledge. Most female pediatric population will be more prone to get anemia compared to the males. Recent study on school children of rural Hyderabad has been concluded that children with better hemoglobin levels are more physically fit compared to the children with low hemoglobin levels. Nutritional status plays utmost important role in child development^[6]. The main aim of our study is to find out the prevalence of anemia in pediatric population of MGM Hospital, Warangal. This study is an observational study, in which the data is collected from patient's case profiles and by interacting with their caretakers.

II. Materials And Methods

The study site includes the pediatric ward of MGM Hospital, Warangal. The children admitted in this hospital are from different villages near Warangal, and most of them are economically poor. Our study was an observational study, the children with anemia and other co-morbidities were enrolled in this study. Age, weight, gender, economic status, type of anemia, co-morbidities, laboratory findings, consanguinity, mother's education, and father's education data has been collected from 140 children. The data collected was entered in Microsoft Excel sheet and analyzed. The data entered in systemic manner of age, sex, Reg. no, weight, residence, type of anemia, co-morbidities, consanguinity, occupation and economical status. The results were drawn using Graphpad Prism (v9.0).

III. Results

Out of 140 patients, 65 were male patients (46.4%) and 75 (53.5%) were female patients. The mean age of male population was 5.9 ± 4.1 years, and the mean age of female population was 7.3 ± 4.1 years. The figure 2 indicates the prevalence of iron deficiency anemia and sickle cell anemia is high in the children living in rural areas of Warangal, and the incidence is more in females than in males. The mean age of Males is 5.9 ± 4.1 years and Females is 7.3 ± 4.1 years. The mean weight of total subjects is 17.56 ± 5.2 kilograms. The mean age of males is 16.16 ± 7.7 years and the mean age of females is 18.7 ± 8.6 years respectively. The type of anemia is diagnosed by considering the hemoglobin levels of the patients which are collected from their case reports, The range of hemoglobin levels in males is 2 to 12 g/dl whereas in females is 3 to 12 g/dl. The mean range of hemoglobin levels in males is 6.6 ± 2.2 g/dl and females is 6.4 ± 2.18 g/dl respectively.

IV. Discussion

In our study, the incidence of anemia was higher in females (54%) than in males (46%) consistent with the results whereas a study conducted by Mauricio S Leite et al., have documented that the males are higher at risk of getting anemia^[7]. According to our study, the prevalence of iron deficiency anemia is higher in females (19.2%) than males (18.5%) whereas a study conducted by Y Keskin et al., have documented that the prevalence of iron deficiency anemia is higher in males than females^[8]. According to our study results the incidence of anemia is high in the children with the hemoglobin range between 2 to 10 g/dl, than in the children with the hemoglobin range 11 to 15 g/dl. According to our study, the children with the age of <1 year to 2 years have the high incidence of iron deficiency anemia in which males have high incidence than females consistent with the results of study conducted by EH Siegel et al.,^[9]. According to our study, out of 140 patients, the children (43.1%) with the age of 8 to 15 years shows the high prevalence of anemia in which females (62.2%) are more prevalent than males (37.7%) compared to the study conducted by B Sudhagandhi et al.,^[10]. According to our study, out of 140 pediatric patients, the children within the age group of 1 month to 36 months (29.2%), have the overall prevalence of anemia, in which the incidence of iron deficiency anemia is high i.e., 60.9% and severe anemia is 0.97%. the incidence of other types of anemia is 39.0%. And also the prevalence is more in male population (53.6%) than in female population (46.3%). Our study results are compared to the study conducted by Ai Zhao et al.,^[11].

According to our study the prevalence of nutritional anemia is 0.35% out of 140 patients, which is seen in the age group of 6 months to 11 years with the mean of hemoglobin is 6.76 ± 1.2 g/dl of hemoglobin. Our study results were compared to the study conducted by N Sinha et al.,^[12]. According to our study the prevalence of high in underweight children compared to normal weight and obese children in which 56% of patients are suffering from iron deficiency anemia compared to the study conducted by O Pinhas-Hamielet al.^[13].

According to our study, the prevalence of anemia in children of 6 months to 5 years of age (45.7%), the prevalence of iron deficiency anemia is high i.e., 43.7% with the other different types of anemia accordingly. Our study results were compared with the study conducted by Mohamad Rahim Kadivaret al.^[14]. According to our study the pediatric patients of 140 patients, considering the age group 3 to 5 years (27.14%) have high prevalence of iron deficiency anemia (34.2%), severe anemia (10.5%), other types of anemia (55.2%). Our study results are compared to the study conducted by Shally Awasthi et al.^[15].

V. Figures And Tables

Table 1: Summary of residence in children (urban and rural)

GROUP	ALL CHILDREN	BOYS	GIRLS
All children	140	65	75
Urban children	4	2	2
Rural children	136	63	73

Table 2: Summary of anemia prevalence in children (urban and rural)

GROUP	ALL CHILDREN	BOYS	PREVALENCE (boys %)	GIRLS	PREVALENCE (girls %)
All children	140	65	46.4%	75	53.5%
Urban	4	2	1.42%	2	1.42%
Rural	136	63	45.0%	73	52.15%

Table 3: Co-morbidities in different types of anemia

CO-MOR	MALES	FEMALES	B-TH	HA	IDA	MA	NA	SC TH	SCA	SA	TH C	TH M
MALARIA	5	3		1				1	2	2	2	
BR. PNEU		2			2							
AC GE	2				2							
CCF	2	1	2							1		
CHR MLB		1				1						
F S	2				1						1	
DENGUE	1										1	
ENTERIC.F	2				2							
FEVER		6			5				1			
HEMATEURESIS		1			1							
HEMIPLEGIA		1									1	
LRTI		1			1							1
MRCP		1				1						
PYREXIA	3	3			3		2					
RT LL PNEU		1			1							
PAINFUL CRISIS	1								1			
UTI	1	2			2		1					
URTI	2			1	1							
SEPTICEMIA		1			1							
VIRAL PYREXIA	6	3			5					1	3	
VIRAL HEPATITIS	1	1		2								

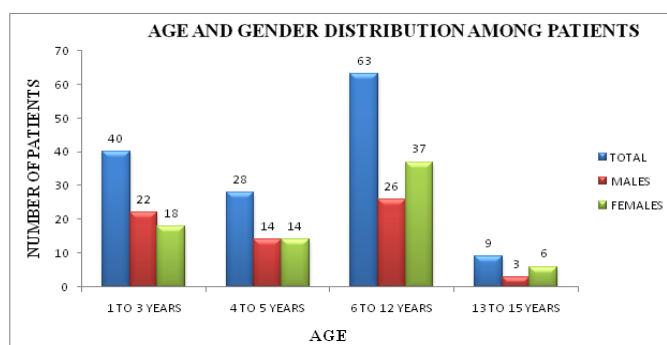


Fig 1: Age and gender distribution among patients

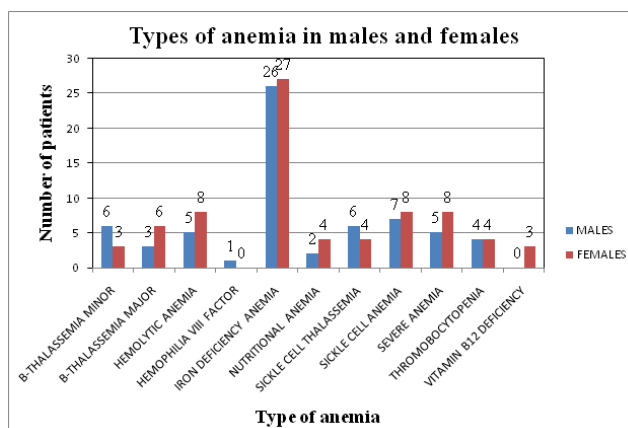


Fig 2: Type of anemia in Males and Females

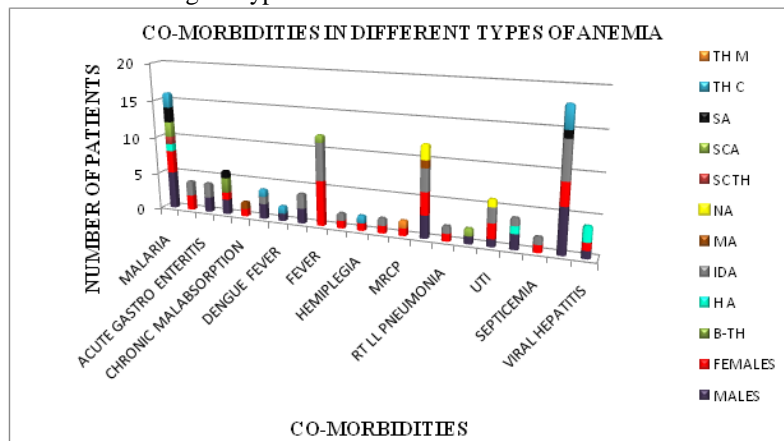


Fig 3: Co-morbidities in different types of anemia

VI. Conclusion

In conclusion, we documented the prevalence of different types of anemia, in which the iron deficiency is highly prevalent i.e., 37.85%. Early detecting of anemia is done by screening different etiological factors like symptoms, and laboratory findings by early referral to pediatrician. The other risk factors associated with the disease are also discussed with the patients and patient's care takers.

From our study, a strong associated between anemia and different co-morbid conditions like malaria, fever, viral hepatitis, bronchopneumonia etc was found. Therefore it is necessary to identify anemia in different co-morbid conditions as soon as possible and manage them before development of anemia. AS mainstay, treatment of anemia in pediatric population is optimal, therefore it is highly recommended to do iron studies and dose adjustments to maintain hemoglobin level to the target levels. The present investigation might help the clinicians to initiate good treatment to reach the treatment goals. Thus, it is recommended that all should be monitored regularly to avoid complications and mortality.

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