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An Analysis of Anemia Cases in general public of Malwa region in a tertiary care centre

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Abstract

India has one of the highest rates of anemia cases globally. Pregnant women and younger children have a increased prevalence. Over 50% of child bearing age women in India are anemic. Anemia predominantly affects underprivileged factions, but it is unclear how these variations have changed significantly. This study included 500 randomly chosen anemic patients to screen for different types and severity of anemia, as well as to analyze their clinical profile. According to the study, anemia is more common in some high-risk groups, including people under 35, women's, people living in rural areas, and people who are impoverished, vegans, and people with low body mass index. Since screening the entire population would be difficult, we can focus on screening certain risk groups, which would be more affordable.

Keywords: Anemia; Pregnant, Child Bearing Age, Impoverished, Vegans.

Introduction

Anemia affects 1.62 billion people worldwide, or 24.8% of the total population[1]. Anemia is prevalent in South Asia at some of the leading rates globally[2], with over half of the people in India suffering from anemia and about one-third of women who are of reproductive age being underweight[3]. Anemia is the cause of 20–40% of maternal deaths in this region, which has a high rate of maternal mortality[4,5]. It is critical to comprehend the trends and patterns of anemia in women of reproductive age due to the significance of attending to their nutritional and health needs. The usefulness of anemia prevalence estimates is contingent upon their correlation with a comprehensive picture of the diverse causative factors that give rise to anemia within particular contexts.

Aims & Objectives

This study was carried out to investigate the clinical profile of anemia and screen for different patterns and severity of anemia.

Materials & Methods

This open study included 500 anemic patients who were either admitted to the Department of General Medicine or were receiving outpatient care, and were chosen at random based on following inclusion and exclusion criteria.

Inclusion Criteria

Cases of anemia as defined by WHO[6]

Exclusion Criteria

Anemia occurring due to acute blood loss.

A thorough history was taken, paying special attention to the patient's symptoms, eating patterns, addiction(s), place of residence, and income. We performed a complete physical examination on each patient. The following investigations were conducted on each patient.

Complete Blood Count (CBC).

The CBC consists of hemoglobin concentration, hematocrit (packed cell volume), mean corpuscular hemoglobin (MCH), mean corpuscular volume (MCV), total erythrocyte count, total and differential leukocyte count and platelets count. CBC was performed using automated analyzer.

Peripheral Smear Examination

It was done by preparing a thin and even film stained with Leishman's stain and was evaluated for red cell morphology, white cell morphology and platelet count. A special note was made regarding the percentage of 5 or more lobed neutrophils, and any other abnormal cells.

Observations

Table 1: Distribution of cases according to severity of anemia

S. No.	Severity of anemia (Hb in gm/dl)	No. of cases	Percentage
1.	Mild	97	19.4
2.	Moderate	238	47.6
3.	Severe	165	33
	Total	500	100.0

Table 2: Distribution of cases according to type of anemia

S.No.	Type of Anemia	Mean MCV (fl.)	Mean MCH (pg.)	No. of Patients
1	Microcytic hypochromic	73.1	24.5	200(40%)
2	Macrocytic	104.9	29.0	130(26%)
3	Normocytic normochromic	85.64	29.3	115(23%)
4	Dimorphic	100.5	24.6	55(11%)

Table 3: Demographic profile

Variable		Severity of anemia				Type of anemia			
AGE p=<0.01	(years)	Mild (%)	Moderate (%)	Severe (%)	Total	MH	MA	NN	DA
18-34		45 (19.1)	101 (43)	89 (37.9)	235(47)	125	70	15	25
35-54		29 (19.3)	65 (43.3)	56 (37.4)	150 (30)	50	40	40	20
≥ 55		23 (20)	72 (62.6)	20 (17.4)	115 (23)	25	20	60	10
Sex P<0.05									
Male		55 (24.6)	96 (43.1)	72 (32.3)	223 (44.6)	80	58	65	20

Female	42 (15.2)	142 (51.3)	93 (33.5)	277 (55.4)	120	72	50	35
Socioeconomicstatus[7] p>0.05								
APL	19	68	43	130	40	33	37	20
BPL	78	170	122	370	160	97	78	35

Table 4: Distribution of cases according to residence and body mass index

Variable	Severity of anemia			
Residence P<0.05	Mild	Moderate	Severe	Total
Rural	80(21.2)	166(43.9)	132(34.9)	378
Urban	17(13.9)	72(59)	33(27.1)	122
Body mass index[8] p<0.05				
<18.5	45(15.8)	138(48.6)	101(35.6)	284

Table 5: Distribution of cases according to presenting symptoms and signs

S. No.	Symptoms	No. of Patients (%)	Clinical signs	No. of patients (%)
1.	Weakness & fatigue	500(100%)	Pallor	500(100)
2.	Decreased work performance	400(80%)	Splenomegaly	118(23.6)
3.	Breathlessness	117(23.4%)	Hepatomegaly	105(21)
4.	Swelling over body	88(17.6%)	Pedal Edema	88(17.6)
5.	Anorexia	71(14.2%)	Hemic Murmur	75(15)
6.	Palpitation	50(10%)	Koilonychia	45(9)
7.	Pica	15(3%)	Glossitis	40(8)
8.	-	-	Stomatitis	32(6.4)
9.	-	-	Icterus	30(6)
10.	-	-	Lymphadenopathy	8(1.6)

Table 6: Distribution of cases according to dietary habit and addiction

Dietary habit p<0.01	Type of anemia				Total
	Microcytic hypochromic	Microcytic	Normocytic normochromic	Dimorphic	
Vegetarian	135	95	55	40	325
Mixed	65	35	60	15	175
Addiction p<0.01					
Tobacco only	40(38.1)	25(23.8)	35(33.3)	05(4.7)	105
Alcohol only	05(14.3)	20(57.1)	05(14.3)	05(14.3)	35
Both T & A	10(25)	15(37.5)	15(37.5)	0(0)	40

Discussion

Across all age groups in the present investigation, moderate anemia was the most prevalent. Table 1 shows that of the study subjects, 47.6% had moderate anemia, 33% had severe anemia, and only 19.4% had mild anemia. These results were consistent with a study by Bansal et al.[7], which found that the majority of cases (45.2%) had moderate anemia, 40.5% had mild anemia, and only 14.3% had severe anemia. This discrepancy in the number of patients suffering from severe anemia could be attributed to a number of factors, including a lack of health literacy, limited access to medical facilities, and a high prevalence of superstitious beliefs among the participants in our study who hinder early detection of anemia.

Peripheral smear analysis of the 500 patients in the current study showed that 200 patients (40%) had microcytic hypochromic picture, 130 patients (26%) had macrocytic picture, 115 patients (23%), and 55 patients (11%) had normocytic normochromic picture [Table 2].These results are consistent with those of Joshi et al.[8], who found that 407 (55.5%) of the 740 anemic patients had microcytic hypochromic anemia, 208 (28.1%) had normocytic normochromic anemia, and 125 (16.8%) had macrocytic anemia.

When confirmatory tests are not performed in screening studies, an estimate of the common etiology of anemia can be made by this morphological typing method. Those parameters that require additional confirmation through specialized testing, such as iron studies, cobalamin/folate levels, or electrophoresis (e.g., to detect iron deficiency anemia, Thalassemia syndromes, anemia of chronic disorders, megaloblatic anemia, etc.), can be used to determine the etiology.

The average volume of a red blood cell, or MCV, is a useful metric for classifying anemia and may provide light on the pathophysiology of disorders involving red blood cells[9,10,11]. Mean MCV<80 fl and mean MCH<26 pg are the most sensitive markers of iron deficiency anemia, according to Joostenet al.[12]. The mean MCH in microcytic hypochromic anemia was 24.5 pg and the mean MCV was 73.1 fl in the current study. 36 (83.72%) of the 43 patients with iron deficiency anemia had mean MCVs that were below normal, per a study by Guyatt et al.[13]. and 40 (93.02%) patients had mean MCH less than normal, 3 (6.97%) had normal, and 7 (16.21%) had MCV greater than normal. The mean MCV in macrocytic anemia was 104.9fl, and the mean MCH was 29.0pg. Craig[14] observes that the mean MCV and MCH of 58 geriatric persons with megaloblastic anemia were 112.6 fl and 26.5 pg, respectively. of the 500 cases, the largest percentage (47%) belonged to the age group under 35, followed by 35 to 55 years (30%), and the age group over 55 years (23%). These results are consistent with a Joshi et al. study[8], which found that the majority of cases—474 out of 740, or 64.19 percent—were in the 20–40 age range. These are life's child bearing years. The majority of anemia found in females aged 15 to 35 is most likely caused by menstruation and pregnancies. Therefore, early detection and accurate diagnosis allow for early intervention and the prevention of more life - threatening complications related to anemia.

The most common type of anemia in the 15–34 and 35–54 year old age groups was microcytic hypochromic. Conversely, the most prevalent form of anemia in the age group of over 55 was normocytic normochromic (52.17%), with microcytic hypochromic (21.8%), macrocytic (17.4%), and dimorphic (8.69%), in that order [Table 3]. These results are in good agreement with a study by Bhasin and Rao[15], which found that normocytic normochromic anemia (62%) and microcytic

hypochromic anemia (30%) were the two most common types of anemia in the elderly.

According to Table 3, the current study shows a preponderance of female cases, with 55.4% of all cases being female and 44.6% being male. These results are in good agreement with the Joshi et al. study[8], which found that out of the 740 anemic patients, 42.5% (314/740) were male and 57.5% (426/740) were female. It was also discovered in this study that severe anemia was more common in women.

Just 24.4% of the study group's patients were from urban areas, compared to the majority of 75.6% who came from rural areas [Table 4]. These results are consistent with a study by Kaur & Kocher[16], where the majority of patients (91.3%) came from rural areas. In their investigation, Bansal et al.[7] also discovered that anemia prevalence was significantly higher in rural than in urban areas. The current study also discovered that the rural population had a higher prevalence of severe anemia. There may be more anemia patients in rural areas due to poor nutrition, a lack of health awareness, and limited access to medical facilities.

The majority of cases in the current study (74%) fell into the low socioeconomic level (below the poverty line) category [Table 3]. According to Verma et al.[17], the occurrence of anemia was maximum (88.9%) in low socioeconomic groups among the 1159 cases. Bansal et al.[7] also discovered that people in lower socioeconomic status groups had a higher prevalence of anemia. Anemia in lower socioeconomic groups can be primarily caused by nutritional inadequacy resulting from an improper diet.

Although it was statistically insignificant, the group of people living below the poverty line (BPL) had higher rates of anemia in all degrees. A greater proportion of patients (76/97, or 78.3%) had severe anemia. This is consistent with research by George Kaplan et al.[18], which found that anemia was one of the conditions that affected people with lower socioeconomic status more severely. According to estimates, the proportion of people living below the poverty line in 2011–12 was 21.9% nationwide, 13.7% in urban areas, and 25.7% in rural areas[19].

The predominant presenting symptoms experienced by all patients (100%) in the study group were weakness and easy fatigability. For 80% of cases, the next most frequent symptom was a decline in work output.

Cardiovascular symptoms, such as dyspnea in 23.4% of patients, edema over dependent areas in 17.6%, and palpitations in 10% of patients, were reported. The least frequent presenting symptom (3%), according to Table 5, was pica. These results are in good agreement with a study by Bhasin and Rao[15], which discovered that exhaustion was the most prevalent symptom, occurring in 74% of patients; anorexia and palpitations were the next most common symptoms, occurring in 13% of patients, and dyspnea upon exertion was observed in 11% of patients.

Pallor was the most common clinical sign that all patients had, followed by splenomegaly in 23.6% of cases, hepatomegaly in 21% of cases, edema in 17.6% of cases, hemic murmur in 15% of cases, koilonychia in 9% of cases, and glossitis in 8% of cases [Table 5]. Lymphadenopathy was the least common sign, occurring in only 8(1.6%) of the cases. These results are in good agreement with the study by Mehta and Patel[20], which identified pallor in 100% of patients, hepatomegaly in 37.3%, splenomegaly in 24%, hemic murmur in 21% of patients, glossitis in 9% of patients, and koilonychia in 5% of patients as significant clinical findings.

According to the data, 284/500 patients, or 56.8%, had low BMIs (<18.5), 180 patients, or 36%, had normal

BMIs (18.5–25), and only 36 patients, or 7.2%, had high BMIs (>25). [Table 4].These results are consistent with a Maitiet al. study[21], which found that 68.2% of the cases had low BMIs, 29.4% had normal BMIs, and only 2.32% had high BMIs. Patients with low BMI levels were more likely to suffer from severe anemia. These results point to dietary factors or nutritional deficiencies as the primary cause of anemia. In a WHO expert consultation, the issue of whether population-specific body-mass index (BMI) cut-off points are required for identifying overweight and obesity in Asian populations was discussed, along with the interpretation of recommended BMI cut-off points[22].

Only 35% of the patients in the current study had mixed dietary habits, while the majority of the patients (65%) were vegetarians [Table 6]. These results are in line with those of Rawatet al.[21], who found that the majority of their subjects (80.76%) were vegetarians. Elderly vegetarians are more prone to anemia, according to Morley[24].

Among the various forms of anemia, those who ate a vegetarian diet had a statistically significant higher prevalence of macrocytic and dimorphic anemias. In their study, Bhasin and Rao[15] found that all of the patients with macrocytic anemia were vegetarians, while 32/62 patients with normocytic normochromic anemia and 13/30 cases with microcytic hypochromic anemia were vegetarians.

Of the 105 patients who were exclusively dependent on tobacco, 40 (38.1%) had microcytic anemia, and of the 35 patients who were exclusively dependent on alcohol, 20 (57.1%) had macrocytic anemia. A macrocytic and normocytic normochromic picture was equally evident in those who were addicted to both [Table 6]. A study by Sainzet al.[25] found that peptic ulcers were present in 26.87% of tobacco addiction patients. According to Savage et al.[26], 33.9% of the 121 anemic patients with alcohol addiction also had macrocytic anemia. These results support the hypothesis that addiction of any kind may contribute to anemia and highlight the need for additional research to determine whether treating addiction may help treat anemia.

Recommendation

According to the current study, anemia is more common in some high-risk groups, including those under 35, women, people living in rural areas, people who make less than the poverty line, vegetarians, and people with low body mass index. Since screening the entire country's population is impractical, we can focus on screening these risk groups, which will be less expensive.

Anemia can be morphologically classified, providing insight into its etiology, based on various haematological parameters such as MCV and MCH, as well as clinical history, physical examination, and peripheral blood smear examination. Later on, specific tests can be used to confirm in certain situations.

The current study also showed that non-specific symptoms like weakness, easy fatigue, and reduced quality of work were among the most common signs of anemia.People should not ignore these symptoms and should seek medical attention as soon as possible to ensure an early diagnosis and appropriate treatment for anemia.

These screening studies are crucial for determining the prevalence in different parts of the nation so that treatments and preventative measures can be implemented to manage anemia in the populace. To obtain even more significant data, more research of this kind ought to be conducted on a national level.

Ethical approval: The study was approved by the Institutional Ethics Committee

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