ORIGINAL ARTICLE

Frequency of Anaemia in Patients Presenting to a Tertiary Care Hospital in Lahore, Pakistan

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ABSTRACT

Aim: To document the frequency of anaemia in selected patients who were admitted to in-patient in a tertiary level hospital in Lahore, Pakistan and to find the frequency of various grades of anaemia in male and female patients.

Methods: This cross sectional, descriptive, institution-based study was conducted in Department of Pathology, Allama Iqbal Medical College Lahore from 15th April 2018 to 15th May 2018. A total of 1000 'full blood count' reports were randomly selected from medicine, surgical, paediatrics, oncology and urology wards for this study which were included. Haemoglobin level <13 g/dL for males and <12g/dL for females was considered as anaemic.

Results: Out of a total of 1000 patients, 18% (n=185) were found to be anaemic .There were 82 males (44.32%) and 103 females (55.68%) who were found to be anaemic. Mean haemoglobin level was 7.4±1.3. Moderate and severe anaemia was more common in female patients as compared to males however the difference was not statistically significant (p value=0.9).

Conclusion: Anaemia is more commonly encountered in female patients than male patients presenting to different wards of a tertiary care hospital in Lahore..

Keywords: Anaemia, Iron-deficiency anaemia, Macrocytosis

INTRODUCTION

Anaemia is considered as an important health problem throughout the world[1]. It is a global health issue with outcomes affecting human health, social and economic well being[2]. It is highly prevalent in developing countries and according to WHO estimates; two billion of world's population is considered to be anaemic.[1] Several problems related to anemia have been extensively studied, most notably, the effects of anemia in pregnant woman causing maternal and child complications[3]. World prevalence of anemia is estimated to be about 30% and almost 51% of the young children are affected by it[1]. Iron deficiency anemia is the foremost nutritional deficiency reported in the tropics including South Asia as well as Africa. In South India about 76% of the school children are reported to suffer from anaemia[2]. At Ibadan Nigeria, anaemia was found to occur in 31.5% of children aged between one and ten years attending the University College Hospital[3]. Iron deficiency is the result of an imbalance between intake and the amount absorbed by the intestine which may not be satisfactory to meet body requirements of nutrients. Hence, if the supply of haemopoietic nutrients is not adequate, the bone marrow is dysfunctional and the levels of hemoglobin will be subnormal and a state of anemia will result[1]. Iron requirements depend on age, gender, race, pregnancy, lactation and altitude above sea level.[4] Because of the different etiological factors responsible for the development of anemia in children, information of its prevalence among different socioeconomic groups is important for adopting appropriate measures for its prevention and ultimately control[4].

In Pakistan nutritional anemia is found to be the most common type of malnutrition present in children. According to the 1977 micronutrient survey carried out in Pakistan, about 38% of the population was identified as anaemic.[5] And according to 1988 National Nutrition Survey of Pakistan this percentage rose to 65% for the children aged 7-60 months[6]. Studies by Karim et al[7] reported an association between anemia and socioeconomic status of pregnant women.

The WHO has also given a classification of countries according to the level of public health significance of anemia: a prevalence of 15% is considered as low, 15-40% is regarded as medium while>40% is high.[7] According to WHO estimates for Pakistani non-pregnant women aged 15-49 years, 51% had hemoglobin of less than 12 g/dl and overall mean blood hemoglobin was 11.7 g/dl (95% CI: 11.5-12). On the other hand, of pregnant Pakistani women aged 15-49 years, 50% had blood haemoglobin concentration of less than 11 g/dl and overall mean blood hemoglobin concentration was 10.9 g/ dl (95% CI:10.6-11.2)[8].

The objectives of this study were to document the frequency of anemia in patients who were admitted in certain wards at a tertiary level hospital in Lahore and to find the frequency of various grades of anemia in male and female patients.

MATERIALS AND METHODS

This prospective, cross-sectional, institution-based study was conducted in Department of Pathology, Allama Iqbal Medical College/Jinnah Hospital, Lahore. The inclusion criterion was all 'Full Blood Count' reports of patients who were admitted to Medical, Surgical, Paediatrics, Oncology and Urology wards of Jinnah Hospital Lahore from 15th April, 2018 to 15th May, 2018. Pregnant females and infants were excluded from the study. Complete blood

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counts were determined by using Hematology Analyzer: Sysmex KX-21. A total of 7000 reports were reviewed for this study. Simple random sampling was done to collect data. A total of 1000 reports were included in the study as sample size. The reference ranges for hemoglobin concentration categories used in this study were according to levels recommended by WHO.[9] Hemoglobin level above 13 mg/dL for males and above 12 g/dL for females was considered as normal. Any level below these values was considered as anemic. Hemoglobin between 10-12.9 g/dL for males and between 10-11.9 g/dL for females was categorized as 'mild anemia'. For both genders, Hb level between 7-9.9 g/dL was referred to as 'moderate anemia' and below 7 g/dL was considered as severe anemia. Data was recorded and analyzed using Statistical Package for Social Sciences v20.0 (SPSS, Inc., Chicago, IL, USA). Results were expressed as frequencies, means±standard deviations (SD) and p-values.

RESULTS

There were a total of 1000 patient reports which were included in the study.18.5% (n=185) were anemic according to the laboratory result of full blood count. Figure I showed the frequency of anemia in male and female patients. Mean age of the patients was 33.8±16.8 years. Minimum and maximum ages were 12 and 87 respectively (Fig. 2, Table 1). Mean hemoglobin level, MCV and MCH in the study were7.4±1.9 g/dl 80.4±10.4fl, 24.8±4.pg respectively (Table 2). Females were more anemic as compared to males as moderate (n=59) and severe anemia (n=34) was present in more females than males but the difference is not statistically significant (p value=0.9) [Table 3]. Among different wards, most anemia patients were admitted to Medical ward (60%) and then to Oncology ward (21%) [Fig. 3]. Most of the patients had normocytic normochromic blood picture (n=72, 38%). Microcytic hypochromic anemia was present in 55 patients (29%) [Table 4].

Table 1: Descriptive statistics of age

Age (years)	**n**
Mean	33.8
Std. Deviation	16.8
Minimum	12.0
Maximum	89.0

Table 2: Mean hemoglobin and red cell indices in the anemic patients

	No.	**Min.**	**Max.**	**Mean**	**Std.Dev.**
Hb (g/dl)	185	3.60	10.40	7.4	1.9
MCV (fl)	185	55.00	117.40	80.4	10.4
MCH (pg)	185	11.50	38.20	24.8	4.49

Table 3: Comparison between gender and severity of anemia

Gender	**Severity of anemia**			**Total**
	Mild	**Moderate**	**Severe**	
Male	9	48	25	82
Female	10	59	34	103
Total	19	107	59	185
P value	0.916			

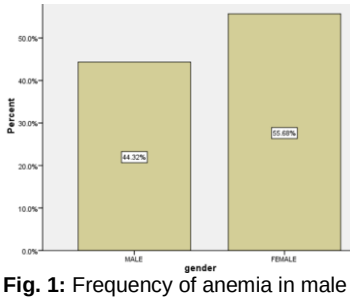

Fig. 1: Frequency of anemia in male and female patients

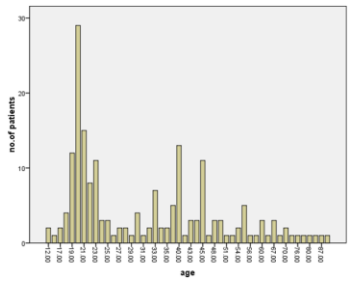

Fig. 2: Age distribution of the anemic patients

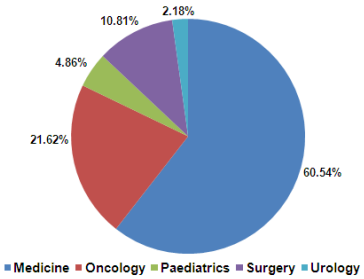

Fig. 3: Distribution of the anemic patients in different wards

Table 4: Comparison of severity of anemia among different wards according to RBC morphology

RBC morphology	Severity of anemia			Total
	Mild	Moderate	Severe	
Microcytic Hypochromic				
Medicine	4	19	12	35
Oncology	-	6	-	6
Paediatrics	-	-	5	5
Surgery	2	4	-	6
Urology	-	3	-	3
Total	**6**	**32**	**17**	**55**
Normocytic				
Medicine	2	18	14	34
Oncology	6	18	2	26
Surgery	3	5	4	12
Total	**11**	**41**	**20**	**72**
Macrocytic				
Medicine	-	3	3	6
Oncology	-	2	1	3
Paediatrics	-	1	1	2
Total	**-**	**6**	**5**	**11**
Normocytic normochromic with few microcytic hypochromic RBCS				
Medicine	1	19	17	37
Oncology	1	4	-	5
Paediatrics	-	2	-	2
Surgery	-	2	-	2
Urology	-	1	-	1
Total	**2**	**28**	**17**	**47**

DISCUSSION

Anaemia is frequently reported among Pakistani population and its prevalence in children and pregnant females has been reported in various WHO reports as well as in local literature. In this study we found a very high frequency of anaemia in non pregnant female patients. Frequency of anaemia in this study is found to be high in both genders in comparison with the available literature[10,11]. Our study re-emphasizes an important fact that anemia is not uncommon in the admitted patients. In our study anemia was seen in almost 18% of the patients under study. As seen in other studies this prevalence was higher in females (55.6%) than in males (44.3%)[11].

The higher frequency can be partly due to the fact that females are more prone to nutritional deficiencies due to repeated pregnancies or menstrual losses. Anaemia is very common in hospitalized patients affecting 30-90% of patients.[12] Causes of anaemia can be multifactorial and can be due to the disease process itself or can be due to certain medicines especially certain antibiotics and almost all known chemotherapeutic drugs, in which case the hemoglobin levels should be monitored and the patients should be treated accordingly.[13] A study conducted in healthy university students in Peshawar reported anaemia in 1.5% in males and 23.9% in female students.[12] This is in accordance with similar studies conducted elsewhere on healthy university students. Although usually women are considered to be a vulnerable population, we need to be aware that sick people are more prone to have anemia regardless of gender. Prevalence of anemia in the general female Indian population was found to be 52%.[6] In our study the majority of the anemic females were found to be in reproductive age group and the presence of anemia was significantly associated with breast feeding and multiparty.[1]

Iron deficiency anaemia has been reported as the most common and well known cause of anaemia.[1] Although in this study normocytic normochromic anemia was mostly noted in the patients, majority of other studies reported prevalence of microcytic hypochromic anemia. Food fortification with iron has been reported to prevent anaemia in certain countries with varying results depending on type of food fortified.[1] Arcanjo et al[14] reported improvement in Hb levels and decrease in anaemia prevalence after using iron-fortified rice. This difference in results with various type of fortification can be attributed to the fact that phytins, which are present in wheat, decrease iron absorption and result in no improvement in haemoglobin levels. Pregnant women are the most likely population group to suffer from anaemia, especially nutritional anaemia[2].

In our study, we excluded the reports from antenatal and obstetric ward; and female population represented in this study was mostly young women, geriatric population and patients admitted in Oncology, Medicine, Surgery and Urology wards. Children from paediatric ward were also included and constitute about 4.9% of total patients. It is in accordance with other studies reported from different parts of the world[15].

To minimise the effect of bias, random sampling technique was used instead of convenience sampling. Further large-scale, multi-centric research is required to elucidate the various age groups vulnerable to developing anaemia, the various risk factors which can cause anaemia, the presenting complaints and the correlation of anaemia with age, gender, socioeconomic status , food fortification with iron should be done to reduce anaemia especially in high risk groups.

CONCLUSION

There is a very high frequency of anemia in patients presenting to tertiary care hospital in Lahore. The frequency was slightly higher amongst female patients compared to male patients. Even after excluding the two high risk groups' i.e. pregnant females and infants, a high frequency rate among females is very alarming and effective strategies are needed to be adopted to prevent this public health issue. Further large-scale, community based research is strongly suggested to precisely investigate the prevalence of anemia in our population.

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