



STUDY OF ANEMIA AND HEMATOLOGICAL PARAMETERS IN PATIENTS OF VARIOUS AGE GROUP

Medical Science

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ABSTRACT

Objective: The aim of this study is to evaluate the Hematological parameters and type of anemia in known anemic cases of different age group. **Material and methods:** This study was carried out in the hematology laboratory, Police Hospital Jammu, J & K for a period of two months (January to February 2018). Total one hundred consecutive anemic patients were selected from the laboratory. The sample for test were collected in EDTA tube and tested on automated analyzer (Rayto Haemarray 83) for hematology indices and other parameters. Microscopic examination of slides was done for peripheral smear examination by leishman's staining. **Results:** Microcytic hypochromic anemia is the most common type of anemia in adults, more in reproductive age group indicating iron deficiency as the main cause. Most affected aged group 21-30 years. It was followed by dimorphic anemia both in men and women. Anemia was present in 44% of men and in 56% of women. **Conclusion:** Anemia is found to be a major public health problem in the study area and is associated with nutritional deficiency, chronic disorders and infection. As a result, a diagnosis of anemia warrants adequate clinical attention.

KEYWORDS

Anemia, Hematological parameters, Nutritional deficiency anemia.

INTRODUCTION

Anemia is a widespread public health problem associated with an increased risk of morbidity and mortality. Anemia is defined as a reduction of the total circulating red cell mass below normal limits. Anemia reduces the oxygen-carrying capacity of the blood, leading to tissue hypoxia. In practice, the measurement of red cell mass is not easy, and anemia is usually diagnosed based on a reduction in the hematocrit (the ratio of packed red cells to total blood volume) and the hemoglobin concentration of the blood to levels that are below the normal range [1]. According to the World Health Organization (WHO), there are two billion people with anemia in the world and half of the anemia is due to iron deficiency. Anemia is a late indicator of iron deficiency, so it is estimated that the prevalence of iron deficiency is 2.5 times that of anemia [2]. Iron deficiency is the most common nutritional disorder in the developing world and the most common cause of nutritional anemia in young children and women of reproductive age. With 40 per cent prevalence of anemia in the world on an average for the general population, the prevalence in the developing countries tends to be three to four times higher than in the developed countries.

In order to characterize the type of anemia and formulate a differential diagnosis, the work-up should include physical examination and laboratory tests, such as evaluations of hematocrit, hemoglobin and red blood cell indices. The red blood cell indices should include the cell count, Mean cell volume (MCV), mean cell hemoglobin (MCH), mean cell hemoglobin concentration (MCHC) and red cell distribution width (RDW) [3].

MATERIAL AND METHODS

The study was conducted in the hematology laboratory, Police Hospital Jammu, J & K for a period of two months (January to February 2018). One hundred clinically anemic patients of all age group with Hb < 11 gm/dl were evaluated in the laboratory. The blood samples were collected in EDTA tubes and reporting was done based on reading from automated analyzer (Rayto Haemarray 83) as well as by peripheral blood smear examination (leishman's stained thin blood film). The evaluated parameters included the hemoglobin concentration and red blood cell indices- Mean Cell Volume (MCV), Mean cell hemoglobin (MCH), Mean cell hemoglobin concentration (MCHC), hematocrit (PCV), Red blood cell count, total leucocyte count, differential count and platelet count. The World Health Organization (WHO) has suggested levels of Hb below which anemia is said to be present. These levels are <11 g/dL in children aged 6-59 months, <11.5 g/dL in children aged 5-11 years, <12 g/dl in older children (aged 12-14), <12g/dl in females >14 years and <13 g/dl in males >14 years.

The reference range of Mean Cell Volume (MCV) was taken as 80-100fl, mean cell hemoglobin (MCH) was taken as 27-32pg, for mean cell hemoglobin concentration 32-36g/dl. Microcytic anemia was taken as MCV value less than 80fl and MCH less than 27. Macrocytic was taken when MCV is greater than 100fl.

RESULTS

Out of 100, more than 50% cases had microcytic hypochromic anemia in both males and females. This is the most common type of anemia in the study. It was followed by dimorphic anemia in both males and females.

Anemia was most common in the age group 21-30 years (32%). Females were more commonly affected than males. We also find a significant value of red cell indices like MCV and MCH. Results of the study are shown in tables 1-6.

Table 1: Age distribution of anemia patients .

Age group	Percentage (%)
< 10 year	8 %
11-20 year	15 %
21-30 year	32 %
31-40 year	22 %
> 40 year	23 %

Table 2: Gender distribution of anemia patients.

Morphological subtype of anemia	Male (%)	Female (%)
Microcytic Hypochromic	26 %	40 %
Macrocytic Normochromic	7 %	3 %
Dimorphic	11 %	13 %

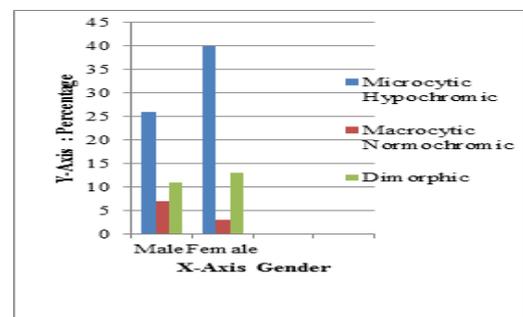


Table 3: Distribution according to morphological subtype.

Anemia subtype	Percentage (%)
Microcytic Hypochromic	66%
Macrocytic Normochromic	10%
Dimorphic	24%

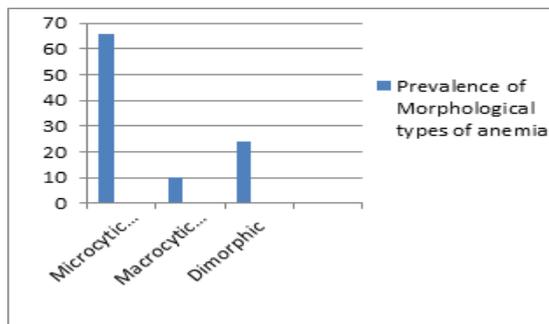


Table 4: Distribution according to age group and morphologic subtype.

Age group	Microcytic hypochromic	Macrocytic Normochromic	Dimorphic
< 10 year	2	2	4
11-20 year	11	-	4
21-30 year	28	2	2
31- 40 year	17	2	3
> 40 year	8	4	11

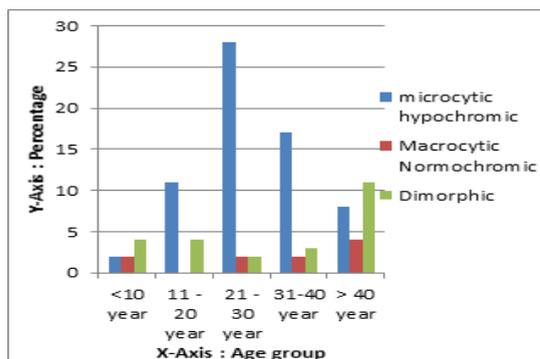


Table 5: MCV level

MCV (fl)	No. of patient	Percentage (%)
< 80	66	66%
80-100	24	24%
>100	10	10%

Table 6: MCH level

MCH (pg)	No. of patient	Percentage (%)
< 27	72	72%
27-32	16	16%
> 32	12	12%

DISCUSSION

Hypochromic microcytic anemia is the most common type of anemia followed by dimorphic and macroovalocytic which is in accordance with previous studies [4] [5]. Iron deficiency anemia is the most common cause for hypochromic microcytic anemia. Other Indian studies have also shown high prevalence of iron deficiency anemia among young women [6] [7]. The high prevalence of iron deficiency anemia among women in childbearing age has important public health implications. It is estimated that anemia accounts for 12.8% of maternal mortality in Asia [3]. Iron requirements are greater in pregnancy, and iron deficiency is associated with maternal death,

preterm delivery, and low birth-weight[8]. In our study 44 were males and 56 were females, females were more affected than males. Similar results have been reported in a study done by kouli R et al [9].

In our study the majority of the subjects were in the age group (21-30 years), this was similar to the S. Patel et al study[10] in which 46% were found in the age group 21-30 years. In our study Microcytic hypochromic anemia 66% is the predominant type of anemia as seen in S Patel et study[10] and Gerardo et al study[11] in which microcytic hypochromic anemia was seen in 72%. This finding was in contrast to the Kaur et al [12] in which normocytic normochromic anemia is the predominant type 56%. In our study dimorphic anemia was found in 24%. The predominant age group in this category was elderly. The most common reason behind both morphological types is nutritional deficiency most common of iron, vitamin B12 and folic acid. Thus it reflects the poor socio-economic and nutritional status of the society.

CONCLUSION

In our study, females are mostly affected and the most prevalent type of anemia is microcytic hypochromic which is mainly due to iron deficiency but other causes like chronic diseases, inflammation, malignancies, etc. may be prevalent. Appropriate screening and subsequent diagnostic testing will allow most cases of anemia to be diagnosed at the earliest. This should happen at the level of primary care physicians to choose screen and treat approach to prevent complications of anemia at level of primary care itself.

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