Original Research Paper

Pathology

STUDY AND ANALYSIS OF MORPHOLOGICAL PATTERNS OF ANEMIA IN GERIATRIC PATIENTS

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ABSTRACT
INTRODUCTION: Anemia in elderly population is a frequently diagnosed problem and if it is untreated ,it can lead to impaired functional capacity, poor quality of life and increased morbidity and mortality. In view of high prevalence of anemia in geriatric population,the study was conducted to evaluate the morphological patterns of anemia in elderly population.
METHODS: A Prospective observational study was conducted on 100 geriatric patients above 60 years of age,for a period of 3 months.Routine haematological investigations and peripheral smear study was done.
RESULTS: In the present study, females were found to be more affected than males and patients in the age group of 60-69 years were affected the most. Normocytic normochromic anemia was the most common morphological type of anemia observed.
CONCLUSION: Despite recent diagnostic advances, geriatric anemia remains under reported and inadequately investigated. Determining the morphological type of anemia can help in finding out the etiology and there by aid in proper diagnosis and better patient management.

INTRODUCTION

World Health Organization defines anemia as reduction in Red blood cell count or Hemoglobin level below the normal percentage for that age[1].

Even though the prevalence of anemia can upswing with aging, anemia among elderly age group should not be accepted as an unavoidable consequence of aging.

Anemia in geriatric population differs in etiology, pathogenesis and treatment compared to anemia in children and young adults.

Etiopathogenesis and clinical features vary according to different types of anemia .Patients with anemia can present with pallor of skin, conjunctiva, syncope, tachycardia and breathlessness[2].

Anemia is more common in developing countries in comparison with developed countries [3,4].

Anemia is classified on the basis of morphology into microcytic hypochromic, normocytic normochromic and macrocytic anemia. According to etiology , anemia is classified into nutritional anemia, haemolytic anemia, anemia due to defect in bone marrow and anemia of chronic disease [5,6].

Classification of anemia is done on the basis of parameters like Total RBC count, Hemoglobin levels, Packed cell volume ,Red cell indices and Peripheral smear studies[7,8].

Anemia in elderly is often being neglected due to more attention being given to other diseases in the elderly.But this is an important shortfall as even mild anemia can compromise the well being of the patient[9].

Anemia in geriatric age group is a global health issue as it increase the risk of morbidity and mortality[10].

Anemia can compromise the well being of the patient and survival regardless of the underlying cause. Failure to timely diagnose and evaluate anemia in elderly may lead to delayed diagnosis of potentially treatable conditions.

In view of the high prevalence of anemia and considerable size of geriatric population the present study was undertaken to determine the morphological patterns of anemia in geriatric patients.

MATERIALS AND METHODS

A Prospective observational study was conducted in tertiary care centre, ACS Medical College and Hospitals, Pathology Department for a period of 3 months from February to April 2021. The study was conducted on 100 geriatric patients above 60 years of age and with Hemoglobin <13gm/dL in males and <12gm/dL in females.

EDTA anticoagulated blood was processed through automated hematology analyser. Hematological parameters were obtained which included Hemoglobin, Hematocrit RBC,MCV,MCH, MCHC and these were compared with peripheral smear prepared with Leishman stain.

INCLUSION CRITERIA
1. Patients above 60 years of age
2. Hemoglobin <13gm/dL in males and <12gm/dL in females

EXCLUSION CRITERIA
1. Patients below 60 years of age
2. Patients who have received blood transfusion within 12 weeks
3. Patients on Chemotherapy or radiotherapy

RESULTS AND DISCUSSION

The study showed that majority of geriatric anemic patients were in the age group between 60-70years, followed by 70-80 years age group.

Out of the 100 geriatric anemic patients, 54 cases were females and 46 were male patients.
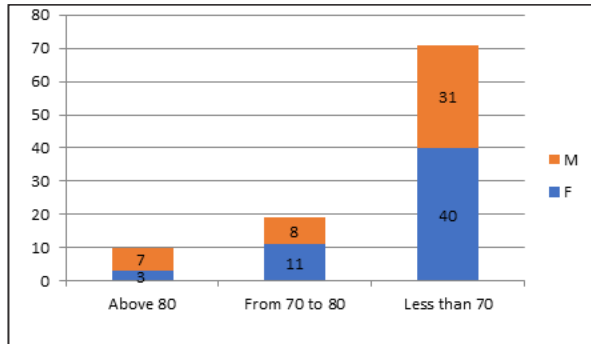
The commonest morphological type of anemia was

Normocytic Normochromic (40%) , followed by Microcytic Hypochromic anemia (37%), Dimorphic anemia (17%), Megaloblastic anemia (4.0%) and severe Microcytic Hypochromic anemia (2.0%).

Table 1 Age & Sex Distribution

AGE	SEX		GRAND TOTAL
	F	M	
Above 80	3	7	10
From 70 to 80	11	8	19
Less than 70	40	31	71
Grand Total	54	46	100

Table 1 showing age and sex distribution of number of anemic cases. Number of female geriatric patients (54) out numbered the number of male patients(46)

Total 100 hemograms of elderly patients with anemia were studied. Majority of the cases were in the age group of 60 to 70 years followed by 70 – 80 years of age group.

Table 2 Morphological Type Of Anemia

MORPHOLOGICAL TYPE OF ANEMIA	AGE			GRAND TOTAL
	ABOVE 80	FROM 70 - 80	LESS THAN 70	
Dimorphic Anemia		2	15	17
Megaloblastic Anemia		1	3	4
Microcytic Hypochromic Anemia	2	8	27	37
Microcytic Hypochromic Anemia(Severe)			2	2
Normocytic Normochromic Anemia	8	8	24	40
Grand Total	10	19	71	100

Table 2 Showing morphological type of anemia among various geriatric age group. Normocytic normochromic anemia was the commonest morphological type (40 cases),followed by Microcytic hypochromic anemia(37 cases)
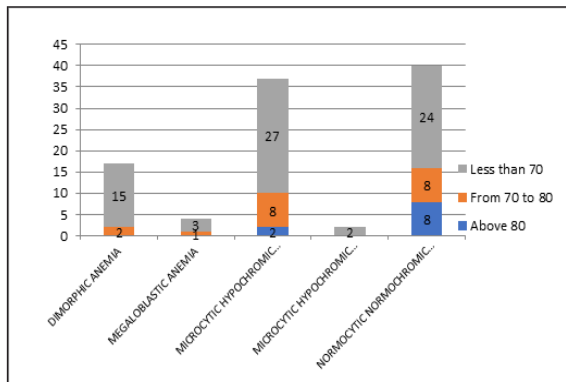

Table 3 Hemoglobin Level

HEMOGLOBIN LEVEL	SEX		GRAND TOTAL
	F	M	
Above 10	13	13	26
From 7 to 10	24	26	50
Below 6	13	7	20
Above 6	3		3
Above 6	1		1
Grand Total	54	46	100
	54%	46%	100%

Table 3 showing haemoglobin levels and gender distribution .Hemoglobin level above 10gm/dl was observed in 26 patients of which 13 patients were females and 13 were male patients. Hemoglobin levels between 7-10 gm/dl was observed in 26 male and 24 female patients.
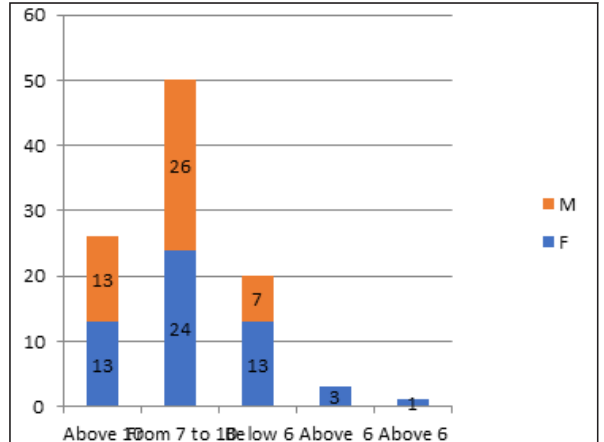

Table 4 morphological Patterns In Male & Female

MORPHOLOGICAL TYPE	MALE	FEMALE	TOTAL
Dimorphic Anemia	8	9	17
Megaloblastic Anemia	4	0	4
Microcytic Hypochromic Anemia	14	23	37
Microcytic Hypochromic Anemia(Severe)	1	1	2
Normocytic Normochromic Anemia	19	21	40
Grand Total	46	54	100

Table 4 showing morphological patterns of anemia among male and female geriatric patients.Among 40 cases of Normocytic normochromic anemia cases, which was the commonest pattern, 21 cases were female and 19 cases were male geriatric patients.
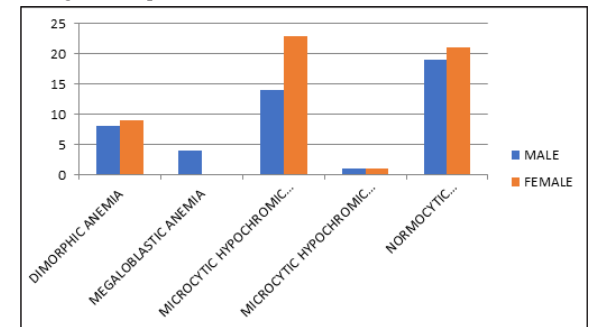

Table 5 Percentage Split By Anemia Type

MORPHOLOGICAL TYPE	PERCENTAGE
Dimorphic Anemia	17
Megaloblastic Anemia	4
Microcytic Hypochromic Anemia	37
Microcytic Hypochromic Anemia(Severe)	2
Normocytic Normochromic Anemia	40
Grand Total	100

Table 5 showing percentage split of Morphological type of anemia. Among 100 cases studied, 40% was constituted by Normocytic normochromic anemia cases, followed by

Microcytic hypochromic anemia(37%)

PERCENTAGE SPLIT BY ANEMIA TYPE

- DIMORPHIC ANEMIA 17, 17%
- MEGALOBLASTIC ANEMIA 4, 4%
- MICROCYTIC HYPOCHROMIC ANEMIA 37, 37%
- MICROCYTIC HYPOCHROMIC ANEMIA(SEVERE) 2, 2%
- NORMOCYTIC NORMOCHROMIC ANEMIA 40, 40%
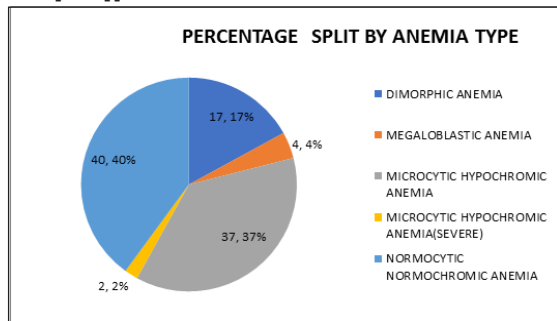
DISCUSSION:

In the present study majority of the patients were in the age group of 60 to 70 years, which is in concurrence with the study by Shrivastava etal, Bhasin etal[11,12]. Females were found to be more anemic in our study.Our findings is in contrast to majority of studies conducted in various parts of India.In the study conducted by Prakash et al., anemic males were 64%[13], while the study done by Bhasin et al 52%[12] were males.However the study conducted by Agarwalla et al reported female predominance(57.9%)[14]

Anemia is an entity which underlies many diseases and is the most common haematological disorder encountered in clinical practice as well as laboratory investigations, which affects almost one third of population world wide.

Evaluation of anemia in elderly is important as it is associated with many complications and which can deteriorate the quality of life. Anemia affects the work out put of an individual as there is decreased oxygenation of tissues.

The most common morphological pattern of anemia observed was normocytic normochromic which corrobates with the study by Shrivastava etal[11], Mann etal[15] and Tilak et al[16].

In the present study normocytic normochromic anemia was followed by microcytic hypochromic anemia, dimorphic anemia and macrocytic anemia.Macrocytic anemia was the least common type of anemia morphologically present in our study, which is in concordance with the study of Prakash et al[13]., Bhasin et al[12] and Shrivastava et al[11] who also reported macrocytic anemia as the least common morphological pattern Anemia of chronic disease is the most common form in elderly, which is the cause for higher prevalence of normocytic anemia.

Higher prevalence of anemia in females may be due to negligence of anemia found during reproductive age group or due to deficiencies mainly iron and folate.

Blood production comes down with advancing age with a decrease in bone marrow elements and increase in marrow fat[17]. In elderly age group the bone marrow response is ineffective to erythropoietin stimulation[18].

Identification of etiology of anemia of chronic disease is challenging in elderly patients as lymphocytes can be seen in any chronic inflammatory diseases[19]. Red blood cell sizes are also not much altered in elderly, hence morphological classification also becomes difficult[20].

The etiology of anemia in elderly can be multifactorial, the most commonest cause being nutritional deficiencies, followed by chronic inflammations, cancers, chronic kidney disease which can be due to diabetes , hypertension and drugs[21].

CONCLUSION:

Anemia among geriatric population is a clinical challenge in

daily practice as the population ages. In most of the cases multiple etiological factors are detected and proper investigations can lead to proper diagnosis.In many cases anemia can be corrected with timely interventions .

Anemia amongst elderly is a health concern in both developed as well as developing countries therefore, early detection and treatment is necessary CBC parameters alone cannot help in determining the cause or etiology of anemia hence peripheral blood smear correlation is important for the evaluation of anemia.

Inspite of many recent advances in the diagnostic field, anemia among geriatric patients remains neglected and poorly investigated. Thereby necessitiating evaluation of even mild anemias in this vulnerable population.

Etiology of anemia can be evaluated by determining the morphological patterns thereby helping in prompt and accurate diagnosis to ensure proper patient management.

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