



ANALYSIS OF CLINICO-HAEMATOLOGICAL PROFILE OF ANEMIA IN GERIATRIC AGE GROUP IN TERTIARY CARE HOSPITAL

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ABSTRACT

BACKGROUND : Anemia is common in all age group including elderly and its prevalence is increased with age. In recent years there has been a sharp increase in the number of elderly persons. The UN agreed cut off to refer to older patients (geriatric age group) as 60+ years. Geriatrics entails the part of life after youth and middle age with deterioration in organs and cell functioning capacity. Every organ of the body is having aging. The world as a whole will have about 435 million additional elderly persons in ensuing next 15 years to reach 1.2 billion by 2025 from 765 million in 2010 (from around 8% in 2010 to around 12% in 2025). **METHODS :** The present study is a cross section study of 184 elderly anemic hospitalised patient in MGM Medical college and Hospital, Aurangabad, during November 2020 to October 2022, which included elderly >60 years with Hemoglobin of < 13 gm/dl in male and < 12gm/dl in female with ethical committee approval are obtained. **RESULTS :** Our study included 184 elderly patients >60 years of age with median age is 69years (IQR- 65-73years) with male to female ratio-0.9:1. Maximum patients were CKD in our study. Total 82(44.56%) patients of chronic kidney disease presented with anemia. sixteen patients among CKD having iron deficiency too. 40 (21.74%)patients are having iron deficiency anemia. 22 (11.96%)patients having anemia of chronic disease which include liver cirrhosis(8), Rheumatoid arthritis(4), chronic uncontrolled diabetes mellitus(4), inflammatory bowel disease(3) and chronic heart failure(3). Megaloblastic anemia found in 13 (7.06%)patients and all are having B12 deficiency. Hematological disorders are 21 (11.42%)which include myelodysplastic syndrome(2), myelofibrosis(1), leukemia(7), lymphoma(6), autoimmune haemolytic anemia (4)and thalassemia minor(1). One (0.5%) patient with deficiency of both iron and B12. Hypothyroidism in one (0.5%) patient and in four (2.18%) patients the cause of anemia was not found in the study. Each etiological conditions have different types of morphology, at present study normocytic 121(65.76%), microcytic 50(27.17%) and macrocytic 13(7.06%) anemia are observed. **CONCLUSION :** Our study highlights the fact that most of the anemic elderly persons have an underlying treatable cause of anemia. Failure to evaluate anemia in elderly lead to delayed diagnosis of potentially treatable conditions. Nonspecific symptoms in elderly like easy fatigability and weakness should never be ignored and should not be always presumed that the features are part of normal aging process.

KEYWORDS : Anemia, CKD (chronic kidney disease), Elderly, Hematological Profile, Outcome.

INTRODUCTION

Anemia is common in all age group including elderly and its prevalence is increased with age. In recent years there has been a sharp increase in the number of elderly persons. The UN agreed cut off to refer to older patients (geriatric age group) as 60+ years. According to the Census 2011, India has 104 million older people (60+years), constituting 8.6% of the total population.^(1,2) The etiology of anemia in elderly person differs widely from the etiology of anemia in younger age. This aspect warrants consideration of anemia in geriatric persons as a distinct entity. World Health Organization criteria consider anemia in elderly as Hemoglobin of less than 12gm per dl in woman and less than 13 g per dl in men. The prevalence of anemia in the geriatric patients worldwide has been found with wide range of 8 to 44 percent; with the highest prevalence in men with age 85 + years⁽³⁾

Haematological parameters are quantifiable constituents of blood like erythrocytes indices, leukocytes and platelets⁽⁴⁾. Ageing is related to the progressive decline in functional reserve of multiple organ systems increasing the probability of dysfunction and disease. Progressive reduction in stem cell due to exhaustion of pluripotent cytokines and production of haemopoietic growth factors cause an imbalance of the haemopoietic modulation as reported by Mariza DS et al.⁽⁵⁾ Due to the universality of these age-related changes, it is generally and strongly suggested that separate reference ranges should be established for each age group as well as sex. Thus, there is need to establish these, particularly in developing countries for stratification. There is scarcity of information in Indian literature this regard especially our down traded Marathwada region of Maharashtra.

Aim

Analysis Of Clinico-Haematological Profile Of Anemia In Geriatric Age Group In MGM Hospital, Aurangabad.

Objectives

1. To analyzed etiology, severity and morphology of anemia in elderly

hospitalized with its hematological profile.

Method :

Study Design: Cross-sectional study.

Study Centre : MGM Medical College and Hospital, Aurangabad

Study Duration: 2years from November 2020 to October 2022.

Inclusion Criteria:

Male patients aged 60 years and above with Hb<13gm/dl
Female patients of 60 years and above with Hb < 12gm/dl.

Exclusion Criteria:

Patients below 60 years of age.
Consent refusal.

Institutional Ethical Approval : obtained

RESULTS

Table 01: Showing age and sex distribution in elderly anemic patients.

Age in years	Total	Gender	
		Male	Female
60 – 69	98 (53.26%)	46 (25%)	52 (28.26%)
70 – 79	82 (44.56%)	42 (22.82%)	40 (21.74%)
80 – 89	4 (2.18%)	1 (0.54%)	3 (1.63%)
Total	184 (100%)	89 (48.36%)	95 (51.63%)
Median	69		
IQR	65-73		

Table 01 showing the age and sex distribution among 184 cases of elderly anemic patients. Our study included 184 elderly patients >60 years of age with median age is 69years (IQR- 65-73years) with male to female ratio-0.9:1

Table 02: Showing clinical features , laboratory parameters and etiology of elderly anemic patients.

Sr No	Factors	Values (n=184)
1.	Age, median (IQR)	69(65-73)
2.	Male, n (%)	89 (48.4%)
3.	Hb, median (IQR)	8.5 (7.2-9.6) p value :0.268
4.	Platelet, median (IQR)	215500 (128500-324250)
5.	TLC, median (IQR)	6264 (3694-9625)
6.	MCV, median (IQR)	85(78-90)
7.	Type of anaemia Microcytic, n (%) Normocytic, n (%) Macrocytic, n (%)	50(27.17%) 121(65.76%), 13(7.06%)
8.	Severity Mild (10-12gm%), n (%) Moderate (8-9.9 gm%), n (%) Severe (<8 gm%), n (%)	29(15.76%) 83(45.10%) 72(39.14%)
9.	Blood loss, n (%)	31(16.84%)
10.	Nutritional anemia, n (%)	22(11.96%)
11.	Chronic liver disease, n (%)	8(4.34%)
12.	Drug induce anemia , n (%)	6(3.26%)
13.	Autoimmune disorder, n (%)	8(4.34%)
14.	Serum creatinine, median (IQR)	1.8(0.8-4.9) (n=179)
15.	Aetiology, n (%) Chronic kidney disease Anemia of Chronic disease Hematological disorder Diamorphic Iron deficiency anaemia Megaloblastic Hypothyroid Unexplained	82(44.56%) 22(11.96%) 21(11.42%) 1(0.54%) 40(21.74%) 13(7.06%) 1(0.54%) 4(2.18%)

In our study 83(45.10%) patients had moderate anemia, 72(39.14%) had severe anemia while 29(15.76%) had mild anemia. Maximum patients 121(65.76%) have normocytic anemia, 50(27.17%) have microcytic anemia while 13(7.06%) have macrocytic anemia.

In 31(16.8%) cases there are history of blood loss. Maximum patients are having history of bleeding piles. Few patients with chronic fissure in ano, Females with history of polymenorrhagia. Patients having nutritional anemia are 22(11.9%). 8(4.3%) patients are found to have chronic liver disease. all are alcoholic. 6(3.2%) patients are taking single or double antiplatelets drug which may cause blood loss from gastrointestinal tract. 8 (4.3%)patients found to have autoimmune disorder.

Maximum patients were CKD in our study (table 06 and 07). Total 82(44.56%) patients of chronic kidney disease presented with anemia. sixteen patients among CKD having iron deficiency too. 40 (21.74%)patients are having iron deficiency anemia. 22 (11.96%)patients having anemia of chronic disease which include liver cirrhosis(8), Rheumatoid arthritis(4), chronic uncontrolled diabetes mellitus(4), inflammatory bowel disease(3) and chronic heart failure(3). Megaloblastic anemia found in 13 (7.06%)patients and all are having B12 deficiency. Hematological disorders are 21 (11.42%)which include myelodysplastic syndrome(2), myelofibrosis(1),leukemia(7), lymphoma(6), autoimmune haemolytic anemia (4)and thalassemia minor(1). One (0.5%) patient with deficiency of both iron and B12. Hypothyroidism in one (0.5%) patient and in four (2.18%) patients the cause of anemia was not found in the study.

Table 03. Showing Etiological causes in elderly anemic patients.

Sr No	Etiological classification	n(%)	Etiological diagnosis (n=184)
1.	Hematological disorder	21 (11.42%)	Myelodysplastic syndrome Myelofibrosis Leukaemia Lymphoma Autoimmune hemolytic anemia Thalassemia minor

2	Chronic kidney disease	82 (44.56%)	CKD with IDA CKD	16 66
3	Anemia of Chronic disease	22 (11.96%)	Chronic liver disease Rheumatoid arthritis Diabetes Mellitus Congestive cardiac failure Inflammatory bowel disease	8 4 4 3 3
4	Dimorphic	1 (0.54%)	Iron deficiency anaemia with megaloblastic anaemia	1
5	Iron deficiency anaemia	40(21.74 %)	Related to blood loss nutritional	18 22
6.	Megaloblastic anaemia	13 (7.06%)	B12 deficiency anaemia	13
7.	Hypothyroidism	1(0.54%)	-	1
8	Unexplained	4 (2.18%)		4

Table 04: Showing Morphological types of Anemia with Grading of Anemia and Aetiology.

Sr No		Normocytic n-121	Microcytic n-50	Macrocytic n-13
1	Age, median (IQR)	69(65-73)	69(65-72)	66(65-70)
2	Male n(%)	64(52.8%)	19(38%)	6(46.1%)
3	Hb, median (IQR)	8.5(7.4-9.5)	8.7(7-9.55)	7.9(6.7-9.9)
4	Severity of anaemia Mild (10-12gm%), n (%) Moderate (8-9.9 gm%), n (%) Severe (<8 gm%), n (%)	17(14%) 62(51.2%) 42(34.7%)	9(18%) 18(36%) 23(46%)	3(23%) 3(23%) 7(54%)
5	Platelet, median (IQR)	212000(121000-316000)	255000(168250-342500)	138000(39000-213000)
6	TLC, median (IQR)	5877(3648-9338)	7005(4634-9778)	5464(3440-11060)
7	Aetiology, n (%) Hematological disorder CKD Anemia of Chronic disease Dimorphic anemia IDA Megaloblastic anemia Hypothyroid Unexplained	14(11.58%) 67(55.37%) 14(11.28%) 1(0.82%) 16(13.22%) 5(4.13%) 1(0.82%) 3(2.48%)	3(6%) 14(28%) 8(16%) 0 24(48%) 0 0 1(2%)	4(30.77%) 1(7.70%) 0 0 8(61.53%) 0 0 0

Maximum patients 62(51.2%) of normocytic anemia have moderate degree of anemia. 42(34.7%) and 17(14%) patients have severe and mild degree of anemia respectively. 23(46%) patients of microcytic anemia have severe degree of anemia while 18(36%) have moderate degree and 9(18%) patients have mild degree of anemia. In macrocytic anemia group 3(23%), 3(23%), 7(54%) have mild, moderate and severe degree of anemia respectively. 55.37% of normocytic anemia are CKD patients, 16% are IDA, 11.5% are anemia of chronic disease. Similar percentage(11.5%) are hematological disorders. 4.1% of normocytic anemia are megaloblastic, 0.82% has diamorphic anemia and 0.82% are hypothyroid. In 2.4% patients of normocytic anemia cause of anemia could not be found out. 48% of microcytic anemia are iron deficient. 28% has CKD, 16% are anemia of chronic disease, 6% hematological disorder while 2% has unexplained anemia. 61.5% of macrocytic anemia are megaloblastic and 30.7% are hematological disorder.

DISCUSSION :

In Recent years , because of better health facilities life expectancy has been increased . At the time of independence of India in 1947 average life span was 52 years presently it is 70.19 years(as per macrotrend .ind) . The United Nations as agreed to refer elderly individuals having with geriatric age group 60+ according to senses 2011.India has 104

million older people constituting 8.6% of total populations.

Aging per say , does not have effect on blood production and therefore, occurrence of anemia in elderly should not be presumed to be secondary to aging per say. The etiology of anemia in these group warrant special attention to delineate to cause of anemia and managements.

As per WHO criteria for anemia 184 patients and above are evaluated. Anemia was evaluated in a manner similar to young adults. In the present study,(table no 1) out of 184 patients male patients are 89(48.36%) and female are 95(51.63%). Median age of the studied group is 69 years with interquartile range 65-73 years, male to female ratio of 0.9:1. A Study By Anderes hg et al concluded that among the 6880 individuals studied , 2905 were men and 3975 with male female ratio is 0.7: 1⁽⁶⁾. Similar results are also found in study by Amarneel et al⁽⁷⁾.

Anemia in Geriatric population consider as a distinct entity. Even mild anemia was significantly associated with greater hospitalization because of co morbidities. The demographic and hematological variables were analyzed according to the objectives of study. In our study mild degree of anemia Hb (10-12g %) are observed in 29 (15.7%) patients ,highest number of patients 83(45.1%) are having moderate degree of anemia Hb (8-9.9g%) and severe degree of anemia (<8 g %) are observed in 72 (39.14%) patients. A Study By Anderes hg et al also has similar results with moderate grade of anemia was most common degree of anemia in 75(41%) patients , followed by severe degree of anemia in 69(38%) patients and 21% of mild degree of anemia⁽⁶⁾. Similar results were found in study by Agravat AH et al⁽⁸⁾.

Our observations of anemia with age group(table no 1)are 98(53.2%) of patients are in the age group of 60-69 years, 82(44.56%) of patients are in the age group of 70-79 , and only 4(2.17%) of patients are in the age of 80-89 years. The study is conducted by kin h et al also revealed that the maximum anemic patients are found among age group 60-69 years ie 50%, followed by 45% and 5 % in age group 70-79 years and >80 years respectively^(9,10).

In our study (table no 02) median hemoglobin in age group 60-69 years is 8.6 gm/dl (IQR-7.2-9.6gm/dl). 70-79 years is 8.45gm/dl (IQR 7.4-9.5gm/dl) and in age group >80 years is 7.6gm/dl (IQR 7.3-8.4gm/dl) the difference is not being significant p value is 0.268. this suggest that There was no change in the mean hemoglobin levels as the age increases. Similar results found in study done by Raisinghani et al^(11,12). Most common etiology of anemia in elderly in our study is chronic kidney disease.(table no 02, and 03) we had 82 (44.86%) patients of chronic kidney disease, 40(21.74%) patients of iron deficiency anemia ,followed by anemia of chronic disease 22(11.96%) and hematological disorder 21(11.42%).Megaloblastic anemia found in 13(7.06%) cases. Rest of etiological factors found in ≤ 10% of the cases. Almost identical results were established in studies done by Martzner Y et al and ,Ferruci L et al^(13,14). Some authors have considered anemia of chronic disease to be the commonest cause of anemia in elderly. In a study done by Davenport J et al and Dr Prakash KG et al , Anemia of chronic disease is considered to be commonest cause of anemia^(15,16).

Though CKD is most common etiology in anemia in elderly, 16 cases among CKD had iron deficiency too in our study. Anemia in CKD can range from erythropoietin deficiency, to deficiency of vitamin B₁₂ and/or folate, iron deficiency, blood loss, inflammation, malignancy, and aluminum intoxication. Anemia in the elderly with CKD is often multifactorial, with iron deficiency being common^(17,18).

Most patients of iron deficiency anemia has history of bleeding piles. Few patients with chronic fissure in ano, and very few females with history of heavy menses and polymenorrhagia. Other than blood loss nutritional deficiency is the major cause for IDA. Cirrhosis of liver, Rheumatoid arthritis, chronic uncontrolled diabetes mellitus, inflammatory bowel disease and chronic heart failure are causes of Anemia of chronic illness in our study⁽¹⁹⁾. In ACD, pro-inflammatory cytokines suppress erythropoiesis and shorten RBC survival. In older age, subtle pro-inflammatory changes may lead to clinically significant anemia Hematological disorders in our study are lymphoma, leukaemia, myelodysplastic syndrome, myelofibrosis, autoimmune hemolytic anemia and thalassemia minor. All 13 cases of megaloblastic anemia are B12 deficient. One patient of diamorphic anemia has both iron and B12 deficiency. One patient found to be hypothyroid. Unexplained anemia found to be in 4(2.18%) in our study(Table 03

).Guralnik J Met al found no cause of anemia in one fourth of elderly patients⁽²⁰⁾. Postulated underlying mechanisms for unexplained anemia in older adults are early myelodysplasia, malnutrition, hypogonadism, low glomerular filtration rate and relative erythropoietin deficiency.

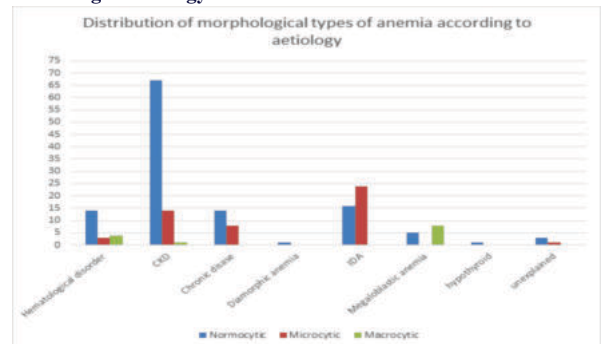
Anemia characterization based on RBC indices. Anemia was classified according to morphological size based on MCV values. Microcytic anemia MCV<80 fl ,normocytic anemia MCV 80 to 100 fl and macrocytic anemia MCV >100 fl. Our study results revealed that normocytic anemia is most common type of anemia . we have 121(%) cases of normocytic anemia, followed by microcytic anemia 50(5%). Macrocytic anemia is present in 13(13%). The etiological diagnosis in normocytic anemia in our study are CKD(55.3%), IDA (13.2%), anemia of chronic disease (11.2%) and hematological disorder(11.5%). Elis et al and Ania et al found in their research elderly patients with normocytic anemia having most common type of anemia⁽²¹⁾. In microcytic anemia group the etiological diagnosis are IDA(48%),CKD(28%) and anemia of chronic disease (16%). Etiological diagnosis for macrocytic anemia are megaloblastic anemia (61.5%)and hematological malignancy (30.7%). All megaloblastic anemia found to have B12 deficiency.

Hematological malignancy are also commonly present as anemia. In our study out of 21 cases of hematological disorder 13 patients having hematological malignancy which includes leukaemia and lymphoma. In study done by bhasian et al, hematological malignancies constituted only 1% such cases.

Conclusion:

Our study highlights the fact that most of the anemic elderly persons have an underlying treatable cause of anemia. Failure to evaluate anemia in elderly lead to delayed diagnosis of potentially treatable conditions. Nonspecific symptoms in elderly like easy fatigability and weakness should never be ignored and should not be presumed that the features are part of normal aging process. It is important and pertinent to look for severity type of anemia and possible etiology. Normocytic blood picture in elderly should never be disregarded. Evaluation of anemia in elderly should be carefully evaluated irrespective of science that reflects in anemia.

Figure 03: Distribution of morphological types of anemia according to aetiology.



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