

Pattern of Anemia in Geriatric Patients:-A Hospital based Prospective Observational Study

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Abstract

Background: Anemia is a common condition in the elderly and a significant risk factor for increased morbidity and mortality, reducing not only functional capacity and mobility but also quality of life. Currently, few data are available regarding anemia in hospitalized geriatric patients.

Material and Methods: Our study is hospital-based prospective observational study, conducted in patients aged 60 years and above at Rural Tertiary care hospital Dr. RPGMC kangra at Tanda H.P. According to WHO, Anemia is defined as hemoglobin level less than 13 g/dl in men and 12 g/dl in women.

Results: Out 554 patients, 382 (69%) patients were found to be anemic. The male to female ratio was 1.36:1. Anemia in males was 68.7% and in females 67.4% respectively. Based on peripheral smear all the patterns of anemia were found. Normocytic anemia was the commonest pattern constituting 76.35%. On the base of etiology anemia of chronic disease (ACD) found in 102 patients (26.7%) followed by iron deficiency anemia (IDA) in 99 patients (25.91%), hematological disorders in 81 (21.20%), mixed in 13 (3.40%), vitamin B12 and folate deficiency in 14 (3.66%) and hypothyroidism in 3 patient (0.78%). Nutritional IDA was seen in seventeen patients.

Conclusions: Substantial awareness of anemia in the elderly is justified due to its high prevalence and negative effect on outcomes, hospitalization duration, and mortality. Geriatric patients should be routinely screened for anemia and its etiological causes including gastrointestinal endoscopy and bone marrow if needed.

Keywords: Geriatrics, Anemia, Iron deficiency, anemia of chronic disease (ACD)

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Introduction

Anemia is a common concern in geriatric age group (more than 60 years of age). In this population, it can have significantly more severe complications than in the younger adults and can greatly hinder the quality of life [1] Anemia in the elderly is the common

problem that is associated with mortality and poorer health-related quality of life, regardless of the underlined cause of the low hemoglobin. [2] However anemia should not be accepted as an inevitable sequelae of ageing. Studies indicate that the prevalence of anemia

increases with advancing age, it is more common in males.[3] Under age 75 years, anemia is more common in females, but beyond age 75 years it becomes almost equal in both male and female. Using World Health Organization criteria for anemia, the prevalence is found to range from 8 to 44 percent, with the highest prevalence in men 85 years of age and older .[4] However, many physicians continue to neglect the significance of anemia as a serious clinical condition in the elderly. Previously, decreased hemoglobin levels were largely considered a normal consequence of aging, now there is evidence that anemia is associated with an increased risk for morbidity and mortality. [5, 6] In geriatrics, anemia is associated with poor performance status, increased frailty, dementia, depression, reduced mobility, increased risk of falls, and poor quality of life.[7] Anemia foretell worse prognosis in elderly patients with cardiovascular and other chronic illnesses. On the base of hemoglobin levels, anaemia defined by the World Health Organization (WHO) (<12 g/dL for females, <13 g/dL for males) [8]. Anemia is present in 10% of women and 11% of men over the age of 65, increasing to 20% of women and 26% of men over 85. [9] Higher prevalence is seen in hospitalized patients, of whom approximately 40–50% have been found to be anemic.[10,8]

Materials and Methods:

This was a hospital based prospective observational study, conducted in a tertiary care hospital Dr.RPGMC Tanda, from January 2017 to march 2019. Our study subjects were older patients aged 60 years and above who attended geriatric OPD and those who were admitted to the medicine ward with clinically suspected and laboratory confirmed anemia. Patients who had received a blood transfusion for last three months and patients who are on radiotherapy and chemotherapy were excluded from our study.

The number of patients taken during the study period determined the sample size. A clinical

research form including a medical and dietary history, socio-demographic data and physical examination was completed. A complete blood count, including red blood cell (RBC) counts, hemoglobin, hematocrit; RBC indices, i.e. mean cell volume (MCV), mean cell hemoglobin (MCH), , red cell distribution width and reticulocyte count ; platelet count; white blood cell count including cell differential and nuclear segmentation of neutrophils. Peripheral blood smears for type of anemia. Serum levels of folate and vitamin B12 were done in patients with dimorphic and macrocytic anemia. Serum iron study including serum iron, total iron binding capacity, and serum ferritin was done for all patients with microcytic blood picture. To rule out anemia caused by inflammation along with ferritin, levels of CRP and ESR were also carried out.

Hemoglobin electrophoresis was done in patients with reduced MCV or MCH and normal iron studies. Patients whose blood smear showing immature white cells, nucleated and abnormal red cells, bone marrow studies were done. Renal function tests (blood urea and serum creatinine), LFT,TFT were also done. In case of unexplained progressive or unresponsive anemia bone marrow examination needed. Stool analysis, gastrointestinal (GI) endoscopy and radiological imaging were performed. We used Statistical Package for the Social Sciences (SPSS), version 16 for Windows, for data analysis, and recorded discrete data as frequency and percentage and symmetrically distributed continuous data as mean \pm SD. According to age The study subjects were divided into three groups 60–69 years, 70–79 years, and 80 years and above respectively. On the base of MCV values, study subjects were categorized into normocytic, microcytic, and macrocytic anemia.

Results:

In the present study age of patients ranged from 60 to 91 years. Out of 554 patients, 382

(69%) patients were found to be anemic. The male to female ratio was 1.36:1. Proportions of anemia in males was 68.7% and in females 67.4%. The mean age was found to be 72.08. Maximum number of patients was in 60-69 years of age range. Among the 382 patients, the etiological distribution of anemia was as such :- anemia of chronic disease (ACD) in 102 patients (26.7%). Chronic kidney disease (CKD) in 62 (16.23%), iron deficiency anemia (IDA) in 99 patients (25.91%), hematological disorders in 81 (21.20%), mixed in 13 (3.40%), vitamin B12 and folate deficiency in 14 (3.66%) and hypothyroidism in 3 patient (0.78%). No etiology for anemia could be found in eight (2.09%) Nutritional IDA was seen in seventeen patients patients shown in table 1. All the types of anemia based on peripheral smear were evident, normocytic being the commonest constituting 76.35 % (69.1% NCNC and 7.25% normocytic

hypochromic) followed by microcytic anemia (11.9%) and macrocytic anemia (6.7%).

Clinical spectrum of anemia

The most common complaint was weakness, seen in 84.3% of patients followed by fatigability (79%), shortness of breath (45.7%), swelling of feet (22.9%), headache (19.5%), vertigo (17.1%), palpitation (11.3%) and tinnitus (6.7%). Vertigo was more common in older patients aged 85 years and above and was found in 26.7% of cases of this age group. On physical examination, pallor was the most common finding, noted in 84.8% of patients; glossitis (19.5%) peripheral edema (16.9%) and koilonychia 9.5%. The mean value of hemoglobin was 8.3 ± 3.3 g/dl with a range of 3.8–12.5 g/dl. Older age group of 80 years and above had lower mean hemoglobin (6.93gm/dl).

Table 1: Etiological classification of anemia in the 382 older patients

Causes	Number (%)
Anemia of chronic disease	102 (26.7%)
Chronic liver disease	33
Solid tumor malignancy	25
Chronic infection	18
Chronic inflammatory condition	13
Others	14
Chronic kidney disease	62 (16.23%)
Iron deficiency anemia	99 (25.91%)
Chronic gastritis	28
Upper gastrointestinal ulcer	18
Nutritional	17
Gastrointestinal malignancy	7
Others	29
Hematological disorder	81 (21.20%)
Myelodysplastic syndrome	21
Chronic lymphoproliferative disease	16
Chronic myeloproliferative disease	14
Non-Hodgkin lymphoma	13
Multiples Myeloma	9
Hodgkin Lymph	8

Aplastic Anaemia	8
Folate/vitamin B12 deficiency	14 (3.66%)
Hypothyroidism	3 (0.78%)
Multi-factorial caus	13 (3.40%)
Unexplained cause	8 (2.09%)

On the base of etiology, among the 382 patients, anemia of chronic disease (ACD) found in 102 patients i.e (26.7%) underlying chronic diseases were chronic liver disease, malignancy, pulmonary tuberculosis, rheumatoid arthritis, reactive arthritis, left ventricular failure, angiodysplasia, pulmonary aspergillosis, and liver abscess. Chronic kidney disease (CKD) in 62 (16.23%), iron deficiency anemia (IDA) in 99 patients (16.23%), hematological disorders in 81 (21.20%), mixed in 13 (3.40%), vitamin B12 and folate deficiency in 14 (3.66%) and hypothyroidism in 3 patient (0.78%). No etiology for anemia could be found in eight (2.09%) patients. Among the 99 cases of IDA, upper GI lesions were observed in 53 patients

(54%), which included chronic gastritis in 28 (30.7%), 23.3% patients constituting (peptic ulcer disease, esophagitis with hiatus hernia, carcinoma esophagus and celiac disease). GI malignancy was found in (7) of IDA patients. Nutritional IDA was seen in seventeen patients. In our study, 81 cases were due to hematological disorders. Out of these, 21 patients had myelodysplastic syndrome (MDS) chronic lymphoproliferative disease in 16, chronic myeloproliferative disease in 14, Non-Hodgkin disease and Hodgkin disease in 13 and 8 subjects respectively. Multiple myeloma in 9 cases. Aplastic anemia in 8 cases.

Table 2: Percentage of anemia according to Age and Sex

Age group	Male no.& %	Female no.& %	Total no.& %
60-69	168 (51)	161 (48.93)	329 (59.38)
70-79	92 (54.43)	77 (45.56)	169 (31.50)
>80	30 (53.57)	26 (46.42)	56(10.12)
Total	290	264	554

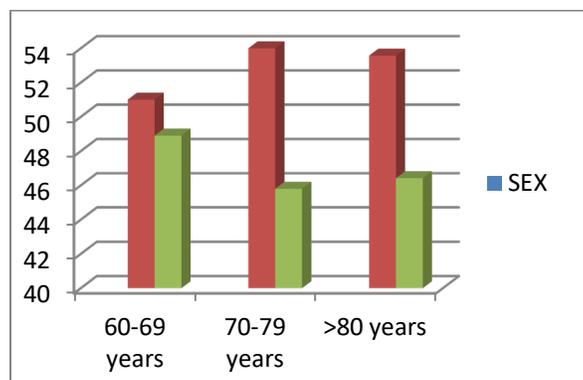


Figure 1: Bar diagram showing gender of subjects suffering from anemia

Table 3: study subjects on the base of pattern of anemia

Distribution of anaemia showing in pie chart		
Pattern of anemia	Frequency	Percentage
Normocytic normochromic	263	69.1
Microcytic hypochromic	45.80	11.0
Normocytic Hypochromic	27.69	7.25
Macrocytic	25.59	6.7
Dimorphic	19.29	5.05
Total	382	100

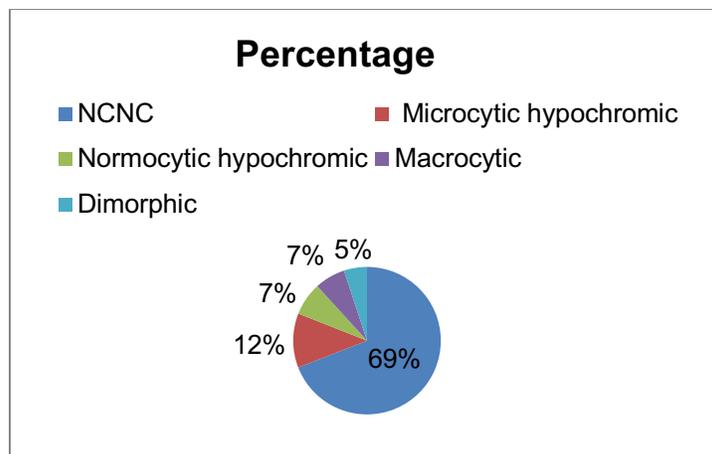


Figure 2: Pie chart:-study subjects on the base of pattern of anemia

Discussion:

Anemia in older persons is common and is often incorrectly attributed to the devastate of normal aging. Haemoglobin should not vary due to age alone in elderly patients who are free of disease with bone marrow. Whether anemia is a marker or mediator of disease is not always clear, but it is usually a signal of pathology and is associated with increased morbidity and mortality. [8,9] Using WHO criteria for anemia, 382 patients of age 60 years and above were included, and underwent complete clinical evaluation and laboratory investigations.

Anemia of chronic disease is the most common form of anemia in the elderly which may be the cause for highest prevalence of normocytic anemia. Associated diseases found in present study were mainly chronic diseases, e.g., chronic liver diseases, infectious diseases, diabetes, malignancy rheumatoid arthritis and renal diseases etc. Although to identify the

causes of anemia, detailed investigations have to be done. Amit Bhasin et. al. study shows that most common pattern of anemia has been normocytic. [10] It is lowest among age group of 60-69 years (66.7%) followed by 70-79 years (68.1%) age group and the highest among the age group of over 80 years (79.4%). Most common pattern in the present study has been normocytic anemia accounting for 78.1%. The present study closely corroborates with this study. In our study percentage of anemia in males (57.6%) has been more as compared to females (42.4%) in harmony to Guralink J.M et. al. whose study has showed that 11.0% of men and 10.2% of women of 60 years and above are anemic.[11] Further evaluation for underlying etiology showed that IDA was the second most prevalent anemia, 22.9% .Upper GI endoscopy performed in patients with IDA with no obvious cause showed that chronic upper GI blood loss, including occult blood from chronic gastritis,

peptic ulcer disease, esophagitis, and carcinoma esophagus constitute 53.8% of IDA cases. Insufficient dietary intake is still a common cause of iron deficiency in developing countries like India. [12] It was seen in 17.7 % of our IDA cases. Malignant, hematological disorders like MDS, myeloma, chronic lymphoproliferative disorder, chronic myeloproliferative disorder, and lymphoma are common in older age. Our sample included 15.2% of elderly patients with malignant hematological disorders and anemia, a higher prevalence than previous studies. MDS should be a diagnostic consideration when other cell lineages are involved. Multiple myeloma is also an important cause of anemia in the elderly. A high index of suspicion is required for this possibility when anemia is associated with back pain, hypercalcemia, or renal failure. In our study, 3.40% of elderly patients had more than one cause for anemia. Multifactorial etiology is common among elderly, and some studies found more than one cause of anemia in more than half of the cases.[13]

The limitation of our study was that we had taken hospital based enrolment of cases. We missed asymptomatic patients or patients with mild anemia who may not had reported to the health center. Further population based studies are needed to ascertain the prevalence and etiology of anemia in the older population of India and to explicate the impact of disease on this age group.[14]

Conclusion.

In India numbers of elder population is rising, family physicians require more attention to evaluate and manage common treatable conditions such as anemia, Confirming the patterns of anemia is critical to direct the investigation for portray the etiology since it is well known that the treatment of anemia is important in improving the overall outcome and quality of life. Failure to evaluate anemia in elderly could lead to delayed diagnosis of potentially treatable conditions. Our study shows that in most of the cases, anemia in the

elderly has a treatable cause. Hence, it is necessary to evaluate the anemia status in all elderly patients.

References

1. Bhasin A, Rao MY. Characteristics of Anemia in Elderly: A hospital based study in South India. Indian Journal of Haematology and Blood Transfusion 2011; 27(1): 26-32.
2. World Health Organization. Definition of an older or elderly person. Retrieved August 29, 2010. <http://www.who.int/healthinfo/survey/ageingdefnolder/en/index.html>.
3. Ferrucci L, Semba RD, Guralnik JM, et al. Proinflammatory state, hepcidin and anemia in older persons. Blood. 2010;115:3810-3826.
4. A.R. Nissenson, L. T. Goodnough, and R. W. Dubois, "Anemia: not just an innocent bystander?" Archives of Internal Medicine, vol. 163, no. 12, pp. 1400–1404, 2003.
5. S. D. Denny, M. N. Kuchibhatla, and H. J. Cohen, "Impact of anemia on mortality, cognition, and function in communitydwelling elderly," American Journal of Medicine, vol. 119, no. 4, pp. 327–334, 2006.
6. B. W. J. H. Penninx, M. Pahor, R. C. Woodman, and J. M. Guralnik, "Anemia in old age is associated with increased mortality and hospitalization," Journals of Gerontology A, vol. 61, no. 5, pp. 474–479, 2006.
7. Penninx BW, Guralnik JM, Onder G, Ferrucci L, Wallace RB, Pahor M. Anemia and decline in physical performance among older persons. Am J Med 2003;115:104-10.
8. World Health Organization, "Nutritional Anemia: Report of a WHO Scientific Group," Technical Report Series, vol. 405, pp. 1–40, 1968.
9. J. M. Guralnik, R. S. Eisenstaedt, L. Ferrucci, H. G. Klein, and R. C. Woodman, "Prevalence of anemia in persons 65 years

- and older in the United States: evidence for a high rate of unexplained anemia,” *Blood*, 2004;104(8):2263–2268.
10. Mzezewa, S. Z., & Mzezewa, S. Effect of gigantomastia on School attendance. *Journal of Medical Research and Health Sciences*, 2020;3(8).
 11. Petrosyan, G. Blaison, and E. Andr´es, “Anaemia in the elderly: an aetiologic profile of a prospective cohort of 95 hospitalised patients,”
 12. *European Journal of Internal Medicine*, vol. 23, pp. 524–528, 2012. Guralnik Jack M, Eisenstaedt RS, Luigi Ferrucci. Prevalence of anemia in persons 65 years and older adults. *Blood* 2004; 104:2263-9.
 13. Camaschella C. Iron-deficiency anemia. *N Engl J Med* 2015;372:1832-43.
 14. World Health Organization. Nutritional anemia: Report of a WHO scientific group. *Tech Rep Ser* 1968;405:1-40.