Clinical Profile and Etiology of Anaemia in Elderly: A Hospital Based Study at a Tertiary Care in the Sub-Himalayan Region

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Abstract

Objectives: The purpose of the present study was to study the clinical profile and aetiology of anaemia in elderly more than 60 years of age at a tertiary care centre.

Methods: 147 elderly patients were studied during one year period, who fulfilled the inclusion criteria of age more than 60 years with anaemia, as per World health organisation. A detailed history, thorough clinical examination and symptom analysis, was done in all the patients. Haematological investigations including peripheral smear and biochemical investigations were done in all patients. Morphological pattern of anaemia was classified based on red cell indices and peripheral smear. From preliminary investigation, further studies were planned according to the probable cause of anaemia. The severity of anaemia was assessed according to the WHO Classification.

Results: Elderly patients ranged from 60 years to 98 years, with a mean age of 68.29 ± 6.25 years. The number of males in the study group was 88 (59.9%), and females were 59 (40.7%), which was statistically significant (p-value <0.05). The most common type of morphological anaemia among elderly patients was found to be normocytic anaemia followed by microcytic anaemia. Anaemia of chronic disease was found to be the most common etiological type of anaemia followed by iron deficiency anaemia, vitamin B12 deficiency and anaemia due to acute blood loss.

Conclusion: Hospitalised patients have more severe anaemia compared to population-based studies where mild anaemia predominates. The morphological and etiological type of anaemia proportions is identical in both population and hospital-based studies.

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INTRODUCTION

Anaemia is a common condition among elderly, and it is a significant risk factor for increased morbidity and mortality, reducing not only functional capacity and mobility but also the quality of life[1]. An abnormally low haemoglobin level due to pathological conditions is defined as anaemia. Anaemia is often overlooked in elderly patients, despite being evident that physical and physiological decline is associated with low haemoglobin levels.

National Programme for Health Care of Elderly defines an elderly as a person above the age of 60 years. According to WHO, anaemia in adults is defined as haemoglobin concentration less than 12 g/dL (7.5 mmol/L) in women and less than 13 g/dL (8.1 mmol/L) in men[2]. Recent population-based surveys have renewed the debate and ascertained the rising prevalence of anaemia in elderly to be a "public health crisis"[3]. Prevalence rates of anaemia in elderly patients vary widely in community-dwelling and institutionalised populations.

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The third National Health and Nutrition Examination survey conducted one of the most comprehensive study of geriatric anaemia in the total US population (1988-1994) which revealed the prevalence of anaemia as 11% in men and 10.2% in women aged 65 years and older[4]. The prevalence of anaemia increased significantly with age, up to 26.1% in men and 20.1% in women aged 85 years and over. Approximately one-third of elderly patients were found to have nutritional anaemia, one-third of the population had anaemia of chronic disease, and the remaining one-third remained unexplained. Hospital based observational studies from India had shown the prevalence rate of anaemia varying from 37.8% to 71%[5,6,7]. This variability is related to some factors, including the setting of the study, the health status of the subject population, and the criteria used to define anaemia. Both population-based and hospital-based studies had shown anaemia of chronic disease and nutritional anaemia as the commonest causes of anaemia in elderly. Other uncommon causes of anaemia include thalassemia minor, hereditary spherocytosis, autoimmune haemolytic anaemia, multiple myeloma, and hypothyroidism and myelodysplastic syndrome.

Anaemia in old age is unique in many aspects. Firstly, its diagnosis poses a challenge as there are innumerable presentations of anaemia which can be easily overlooked. Typical features of anaemia are non-specific and tend to be attributed to advancing age which may present as worsening of other conditions. The aetiology of anaemia in elderly differs sufficiently from younger adults to warrant considering it as a distinct entity. The etiological cause of anaemia in elderly persons may be complicated by polypharmacy and comorbidities, which are particularly common in them.Despite the high prevalence of anaemia in the elderly and the increasing size of the geriatric population, only a few studies had examined the aetiology and effects of anaemia on elderly patients. The present study was done to study the clinical profile and aetiology of anaemia in elderly more than 60 years of age at a tertiary care centre.

MATERIALS AND METHODS

The study was conducted in all consecutive elderly patients admitted in the Department of Medicine, during the one year period, who were satisfying the inclusion criteria. Inclusion criteria included all patients 60 years of age or above with anaemia, as per the WHO criteria. Anaemia was defined as a haemoglobin concentration below 13g/dl in men and 12g/dl in women as per the WHO criteria. A total 147 patients who fulfilled the inclusion criteria were the source material for this study. A detailed informed consent was taken from all participants. A detailed history regarding the presenting complaints with duration of symptoms was taken, and a thorough clinical examination was done in all the patients. Symptom analysis was done along with the analysis of underlying morbid conditions, dietary habits and medication usage. Haematological investigations including peripheral smear and biochemical investigations were done in all patients.

Morphological pattern of anaemia was classified based on RBC indices and further correlated by peripheral smear. Microcytic anaemia was defined as MCV below 80 fl, normocytic as MCV between 80 and 100 fl and macrocytic anaemia by an MCV above 100 fl. The following haematological investigations were carried out in all patients: complete hemogram with peripheral smear, iron studies, vitamin B12 levels and folate levels. Serum ferritin levels were used to differentiate between iron deficiency anaemia and anaemia of chronic disease in addition to MCV and peripheral smear.

By preliminary investigation, further investigations were planned according to probable causes of anaemia. Bone marrow studies were done in patients with peripheral smear showing immature cells and unexplained progressive anaemia and pancytopenia. Additional investigations were done to find the aetiology of anaemia. These were dependent on the morphological type of anaemia. It included autoimmune markers, thyroid function tests, stool examination, stool for occult blood, upper GI endoscopy, colonoscopy, imaging such as chest X-ray, ultrasound abdomen and CT scan, and histopathological analysis in the case of malignancy/suspicious lesion. Thus, patients were classified as per the aetiology of anaemia. The severity of anaemia was assessed according to the WHO Classification. In males, mild anaemia was defined as hemoglobin levels of 11-12.9 g/dl, moderate anaemia as 8-10.9 g/dl and severe anaemia less than 8 g/dl and in females, mild, moderate and severe anaemia was defined as 11-11.9 g/dl, 8-10.9 g/dl and less than 8 g/dl, respectively.

Descriptive statistics and frequency percentages were determined for categorical variables. Means and standard deviations were calculated for quantitative variables. Qualitative variables were analysed using Pearson's chi-square test or Fischer's exact test, whichever was applicable. A p value less than 0.05 was considered significant.

RESULTS

The study included 147 elderly patients of anaemia with age more than 60 years, ranging from 60 years to 98 years, with a mean age of 68.29 ± 6.25 years. The proportion of males and females in the study was 59.9% and 40.7%, which was statistically significant (p-value <0.05). The majority of the patients (70.1%) belonged to the age group of 60-70 years followed by 37 (25.5%) patients in the age group of 71-80 years, and 7 (4.7%) patients were octagenarian.

In the study population, the most common presenting complaint was easy fatigability seen in 71.4% patients, followed by loss of appetite. Haematemesis and melaena were found in 27.2% patients. Shortness of breath was found in 24.5% patients, and swelling feet and abdominal distension were seen in 18.4%patients.On examination, the most common clinical finding in the study population was conjunctival pallor which was seen in 138patients. This was followed by the presence of white nail beds found in 40.8% patients. The mean haemoglobin level of patients was 8.90 ± 1.81 gm/dl.

The most common type of anaemia among elderly patients was found to be normocytic anaemia followed by microcytic anaemia on the basis of both, MCV values and peripheral smear. By MCV values, 60.6% patients had normocytic anaemia, 29.2% patients had microcytic anaemia, and 10.2% patients had macrocytic anaemia (Table I). Peripheral smear showed a normocytic picture in 55.1% patients, microcytic picture in 20.4% patients and macrocytic anaemia was seen in 9.5% patients. In 12.9% patients, peripheral smear showed a dimorphic picture.Three patients were found to have pancytopenia on peripheral smear.

Table I. Morphological Type of Anaemia in Elderly Patients (n=147)

Type of anaemia	Total n=147(%)	Males n=88(%)	Females n=59(%)	p-value
Normocytic	89(60.6%)	56(62.9%)	33(37.1%)	0.494
Microcytic	43(29.2%)	22(51.2%)	21(48.8%)	0.804
Macrocytic	15(10.2%)	10(66.7%)	5(33.3%)	1.0

Anaemia of chronic disease was found to be the most common etiological type of anaemia seen in 53.06% patients (Figure I). Iron deficiency anaemia was found in 27.9% patients. Anaemia due to vitamin B12 deficiency was seen in 19.7% patients while folate deficiency anaemia was seen in 6.8% patients. Anaemia due to acute blood loss was seen in 13.6% patients while only 1.3% patients had unexplained anaemia.Among patients with anaemia of chronic disease, 32 patients were found to have the chronic renal disease, 14.1% were found to have anaemia of chronic disease due to underlying malignancy, 12.8%patients were found to have tuberculosis and 6.7% patients were diagnosed with rheumatoid arthritis.
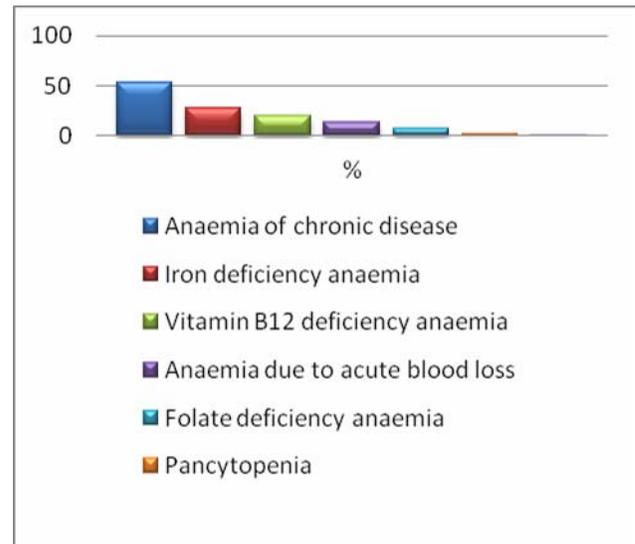

Figure I. Etiological profile of anaemia in elderly patients (n=147)

Among patients with iron deficiency anaemia, 75.6% patients had iron deficiency anaemia secondary to chronic blood loss, 21.9% patients had underlying gastrointestinal malignancy, and only one patient had the nutritional iron deficiency. The most common finding on upper gastrointestinal endoscopy in elderly patients with iron deficiency anaemia was a gastric ulcer (10 patients) followed by duodenal ulcer (8 patients). Upper gastrointestinal malignancy included carcinoma stomach, gastrointestinal stromal tumour and periampullary carcinoma and three patients were found to have lower gastrointestinal malignancy, of which two patients had carcinoma colon, and one patient had carcinoma rectum.

Most common cause of acute blood loss was found to be upper GI bleed from a gastric ulcer and variceal bleeding. Three patients were found to have pancytopenia on peripheral smear. Two out of the three patients were found to have vitamin B12 deficiency.

DISCUSSION

In our study, the age of the patients ranged from 60 years to 98 years with the mean age of 68.29 ± 6.25 years. The mean age among males and

females were comparable. In the hospital-based studies conducted by Bhasin et al[6] and Shrivastava et al[7], the mean age of the study population were 70.51 years and 73.06 years, respectively while in the study by Prakash et al[8], mean age of the study population was lower (66.65 ± 6.43 years) as compared to our study.

In our study, a majority of the patients belonged to the age group of 60-70 years. Also, in different hospital-based studies in India, also, the majority of the patients were in the age group of 60-70 years as shown by Bhasin et al[6], Shrivastava et al[7] and Prakash et al[8]. In our country, population above 60 years of age constitutes 8.6% of the total population, with a majority of them being in the age group of 65-79 years. This may be the reason for the majority of the patients in our study constituting this age group.

Male to female ratio for anaemia in elderly varied according to different studies. In our study, 88 (59.9%) patients were males, and 59 (40.1%) patients were females. In the hospital-based studies by Bhasin et al[6] and Kaur et al[5], the proportion of elderly males were 52% and 54%, respectively. The majority of the hospital and population-based studies showed that males were affected more than females.

70.8% patients among the study population belonged to a rural background. The increased prevalence of anaemia in rural population could be due to lack of awareness among the rural people, leading to ignorance of symptoms and signs of anaemia and predisposing to a social and economic vulnerability of the society.

The majority of the patients presented with more than one symptom. Easy fatigability was the commonest symptom followed by constitutional symptoms including anorexia and gastrointestinal bleeds like haematemesis and melaena. In the study by Bhasin et al[6], easy fatigability, anorexia and shortness of breath on exertion were seen in 74%, 13% and 11% patients, respectively. On clinical examination, conjunctival pallor was the most commonly encountered finding followed by white nail beds. The clinical findings in our study point to the severity of anaemia. These signs appear when the extent of anaemia is severe, suggesting that patients usually present to the hospital when the degree of symptoms increase in severity. Thus, majority of the hospital admissions of elderly persons were found to have moderate to severe anaemia

The current study showed that majority of the elderly patients with anaemia had moderate anaemia, constituting 58.5% of the total patients while severe anaemia was found in 27.9%. This showed that hospital admissions among elderly patients were directly proportional to the severity of symptoms, leading to less proportion of admissions of mild anaemia as compared to the moderate and severe degree of anaemia.

Although the prevalence of different types of morphological anaemia varied depending on the type of study, normocytic anaemia was found to be the most common type of morphological anaemia in the geriatric population in all the studies. The current study showed that anaemia of chronic disease was the most common type of anaemia seen in elderly populations. Among these, 41.02% patients had anaemia due to chronic renal disease. Other causes included acute infections, tuberculosis and chronic inflammatory states such as rheumatoid arthritis. Among the malignancy, 72% were haematological, and rest were non-haematological. Among the haematological malignancies, multiple myeloma was the most common. In the study by Mann et al[9], the most common cause of anaemia of chronic disease was haematological malignancy (40%) followed by renal failure (20%).

Among patients with iron deficiency anaemia in our study, the most common cause was secondary to chronic blood loss. This was followed by gastrointestinal malignancies (21.9%) and nutritional causes (2.4%). In patients with IDA due to chronic blood loss, 75.6% patients had blood loss from the upper gastrointestinal tract, and 17% patients had a lower GI lesion, and one patient had both upper and lower GI lesion. Bhasin et al[6] and Mann et al[9] showed that chronic GI loss was the most common cause of iron deficiency anaemia followed by malignancies. In the study by Bhasin et al[6], an upper GI lesion was found in 78.6%, colonic lesion in 29.4% patients and gastrointestinal malignancy was found in 6.66% patients.

In the NHANES III study[4], vitamin B12 deficiency alone was found in only 5.9% patients, folate deficiency alone was found in 6.4% of the study population, and the combined deficiency was found in 2% patients, which was in contrast to our results.

The substantial percentage of vitamin B12 deficiency anaemia indicates that this diagnosis should be considered and evaluated, especially in vegetarian population and alcoholics. Anaemia associated with vitamin B12 is usually macrocytic, but it may be normocytic or even microcytic. The cause of anaemia could not be found despite extensive investigations in two patients.

The variability in the demographic profile in different studies is due to variation in the

population studied, in both community-based as well as hospital-based studies. Hospitalised patients has more severe anaemia compared to population-based studies where mild anaemia was common. The morphological and etiological type of anaemia proportions is identical in both population and hospital-based studies where anaemia of chronic disease is the most frequent cause followed by iron deficiency anaemia and megaloblastic anaemia. Unexplained anaemia is an uncommon cause in elderly.

Anaemia in elderly is a challenge and has to be approached in a systematic manner for appropriate diagnosis and evaluation to look into its cause and plan management to improve the quality of life of the elderly persons. It is still underreported and inadequately investigated, especially in mild cases.

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