

A PROSPECTIVE STUDY OF MODERATE TO SEVERE ANAEMIA IN ELDERLY HOSPITALISED PATIENTS IN A TERTIARY CARE CENTRE

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ABSTRACT

BACKGROUND

The prevalence of anaemia in elderly population is of great significance as it is a manifestation of the underlying disease and produces severe complications in the elderly. The etiopathogenesis of anaemia in this population is multifactorial and its evaluation helps us to rectify and contribute to the overall better outcome in terms of quality of life. Hence our study was focussed on finding the incidence of moderate to severe anaemia in elderly hospitalised patients, and also to identify the aetiology.

METHODS

This observational study was done in a tertiary care centre on a cohort of 100 patients by screening all patients aged 60 years and above, with haemoglobin of 8 gm/dl and below, admitted in medical ward, for a period of one year. The participants were evaluated with detailed history, clinical examination, complete hemogram and peripheral smear, and routine lab parameters. Special tests like ferritin, TIBC, stool examination, imaging, UGI scopy and colonoscopy, bone marrow studies, and serum electrophoresis, were done on case to case basis. Statistical analysis was done by SPSS method.

RESULTS

Out of the 100 study subjects, 54% were males, and 46% were females. The maximum number of patients were in the age group 60-69 years. The mean age was 71.3 years. Fatigue was the predominant complaint (41%). The subjects were divided into microcytic anaemia (53%), normochromic anaemia (31%) and macrocytic anaemia (16%). Further evaluation was done to identify the aetiology of anaemia, majority (47%) of the patients had anaemia of chronic disease (ACD) followed by iron deficiency anaemia (37%) and megaloblastic anaemia (16%). In our study, we identified the most common cause of moderate to severe anaemia in elderly hospitalised population as anaemia of chronic disease in which anaemia of CKD is the predominant cause followed by gastrointestinal malignancies. Iron deficiency and vitamin B12 deficiency were the next common cause of moderate to severe anaemia in the elderly in which nutritional deficiency was common.

CONCLUSIONS

Anaemia is an important cause of mortality and morbidity in the elderly. Characteristics of anaemia in elderly by systematic algorithm will help to identify and formulate the appropriate management which would definitely improve the quality of life.

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BACKGROUND

Anaemia should not be accepted as an inevitable consequence of ageing. It is known to produce severe complications in the elderly than in the younger population.¹

The prevalence of anaemia in elderly population is of great

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significance as it is often neglected and is a manifestation of the underlying disease. In elderly population about 10 percent of them have anaemia which is mostly mild and may not require hospitalisation. Hence our study was focussed to find the incidence of moderate to severe anaemia in elderly hospitalised patients and also to identify the aetiology. The prevalence rate of anaemia in elderly population vary between 2.9%-51% in men and 3.3%-41% in women.^{2,3} Decreased physical activity, change in diet patterns and inadequate intake of balanced diet especially in developing countries due to socioeconomic factors make the elderly more prone for the development of anaemia. The etiopathogenesis of anaemia in this population is multifactorial and its evaluation helps us to rectify and contribute to the overall better outcome in terms of quality

of life.⁴ Principal factors contributing to anaemia in elderly are chronic disease and nutrient factors in varied proportion in different studies. Hence, we aimed to find out the incidence and causes of moderate to severe anaemia in elderly hospitalised patients in a tertiary care centre.

METHODS

This observational study was done in a tertiary care centre on a cohort of 100 patients by screening all patients aged 60 years and above admitted in medical ward for a period of one year from August 2014 to July 2015. We included patients with 60 years of age and above with haemoglobin of 8 gm/dl and below as our study participants after excluding patients who were on chemotherapy, those who received blood transfusions repeatedly and patients who were on chronic steroid therapy. All patients gave their informed consent prior to their inclusion in the study.

After enrolment the participants were evaluated with detailed history and clinical examination. They were also analysed based upon underlying comorbid conditions, dietary habits and medication usage and history of passing worms and blood in stools. Patients were divided into 3 groups based on the MCV values and peripheral smear into microcytic anaemia (MCV < 80 fl), normocytic anaemia (MCV 80-100 fl) and macrocytic anaemia (MCV >100 fl).

Patients who had microcytic anaemia were subjected to further tests like serum iron, serum ferritin and TIBC. Those who had low ferritin and high TIBC suggestive of iron deficiency were considered for stool occult blood followed by upper GI scopy and lower GI scopy accordingly. Patients who had macrocytic anaemia were subjected to Vitamin B 12 levels and RBC folate assay, Free T4, TSH, viral markers, lab tests for liver diseases. Patients with normocytic anaemia and patients in other categories who do not have any obvious clue for the cause of anaemia were thoroughly evaluated for evidence of chronic inflammatory diseases like pulmonary TB, CKD, CLD with chest x-ray and USG abdomen. Bone marrow studies were done in patients with immature white cells in peripheral smear, unexplained progressive or unresponsive anaemia. Additional investigations, serum electrophoresis, CT and MRI were done based on the necessity to arrive at the diagnosis.

In this study more than 2 groups were identified, and ANOVA is applied. They were checked for statistical significance for selected parameters. Analysis is done by SPSS method.

RESULTS

We included a total of 100 cohorts aged more than 60 years and above with haemoglobin of 8 gm/dl and below.

In our study population, the minimum age limit was 60 years and maximum age was 98 years and the mean age was 71.3 years. Out of the total subjects 54% were males and 46% were females (table 1). Among the six major identified complaints, fatigue was the predominant complaint (41%) followed by dyspnoea (22%), melena (15%), loss of appetite (11%), pedal oedema (10%) and purpura (4%).

Age Group	Total Number	Percentage
60-69 Years	46	46%
70-79 Years	38	38%
80-89 Years	14	14%
>90 Years	2	2%
Mean Age	71.3 Years	
Sex Group		
Male	54	54%
Female	46	46%

Table 1. Demographic Variables of Elderly Patients with Moderate to Severe Anaemia

Aetiology of Anaemia

Based on MCV and peripheral smear the subjects were divided into microcytic anaemia (53%), normochromic anaemia (31%) and macrocytic anaemia (16%) (Table 2). Based on further evaluation to identify the aetiology of anaemia, majority (47%) of the patients had anaemia of chronic disease (ACD) followed by iron deficiency anaemia (37%) and megaloblastic anaemia (16%). (Table 3) The mean haemoglobin in ACD was 6.8 gm/dl, in iron deficiency anaemia was 6.2 gm/dl and macrocytic anaemia was 5 gm/dl (table 4).

Sl. No.	Type of Anaemia	Frequency	Percentage
1.	Microcytic Anaemia	53	53%
2.	Normocytic Anaemia	31	31%
3.	Macrocytic Anaemia	16	16%
4.	Total	100	100%

Table 2. Distribution of Types of Anaemia in Elderly Population

Aetiology of Anaemia	Conditions	No. of Cases	Percentage
Anaemia of Chronic Disease (47%)	Chronic Kidney Disease	16	34%
	Malignancy	10	21%
	Aplastic Anaemia	5	10.6%
	Chronic Infections	4	8.5%
	Thyroid Disease	4	8.5%
	Tuberculosis	4	8.5%
	Cirrhosis	2	4.2%
	ITP	1	2.1%
Iron Deficiency Anaemia (37%)	Nutritional Deficiency	23	62%
	Chronic Blood Loss	14	38%
Macrocytic Anaemia (16%)	Vitamin B12 Deficiency	9	56.25%
	HIV	2	12.5%
	Hypothyroidism	2	12.5%
	MDS	2	12.5%
	Cirrhosis	1	6.25%
Total		100	

Table 3. Aetiology of Moderate to Severe Anaemia in Elderly Patients

Sl. No.	Type of Anaemia	Mean Haemoglobin (gm/dl)	p Value
1.	Anaemia of Chronic Disease	6.8	0.013
2.	Iron Deficiency Anaemia	6.2	
3.	Macrocytic Anaemia	5	

Table 4. Mean Haemoglobin in Various Types of Anaemia

Anaemia of Chronic Disease

47 patients of ACD were evaluated further and found to have the following diseases. 16 patients (34%) had anaemia of CKD, 10 patients (21%) had anaemia due to underlying malignancy, 4 (8.5%) had anaemia due to chronic infection, 5 (10.6%) had aplastic anaemia, 2 cases of cirrhosis (4.2%), 4 cases of tuberculosis (8.5%), 4 cases (8.5%) had anaemia due thyroid disease, 1(2.1%) each due to ITP and rheumatoid arthritis.

Iron Deficiency Anaemia

37 patients developed iron deficiency anaemia out of which 23 (62%) due to nutritional causes and 14 patients (38%) had evidence of chronic blood loss.

Macrocytic Anaemia

Out of the 100 cases 16 were macrocytic anaemia. About 9 cases (56.25%) had megaloblastic anaemia due to vitamin B 12 deficiency, 2 cases each of hypothyroidism (12.5%), HIV infection (12.5%) and MDS (12.5%) and a single case of cirrhosis (6.25%).

DISCUSSION

This study was done to analyse the various causes of moderate to severe anaemia in elderly hospitalised patients. After exclusion, 100 patients were enrolled in our study. The mean age of the patients were 71.3 years. The maximum number of patients were in the age group 60-69 years. Males were 56% and the rest were females. This was similar to the study done by Amit Bhasin et al.⁵

Fatigue was the predominant complaint found in 41% of the elderly population followed by dyspnoea. Fatigue, weakness and dyspnoea are very common symptoms in elderly due to age advancement. Hence, we should have high suspicion of anaemia when they present with the above-mentioned symptoms.⁶

We analysed the mean haemoglobin of all three types of anaemia, and it was lowest in macrocytic anaemia which was statistically significant ($p < 0.01$). In this study predominant cause of anaemia was anaemia of chronic disease (47%). Out of the 47 cases, 16 were due to anaemia of CKD. 10 cases were due to malignancy which included 3 cases each of carcinoma rectum and carcinoma stomach, 1 case each of carcinoma esophagus, carcinoma prostate, multiple myeloma and acute myeloid leukemia. Other causes

of ACD were pyelonephritis, bed sores, PTB, cirrhosis of liver, thyroid disease, ITP and rheumatoid arthritis.

As the patients with CKD had microcytic anaemia it is important to differentiate iron deficiency anaemia from ACD. Serum ferritin and TIBC was found to be useful marker to differentiate the two. Ferritin of more than 100 ng/ml rules out iron deficiency anaemia.⁷ TIBC was high in case of iron deficiency anaemia.

Among the 16 patients with CKD, 10 patients had low ferritin and high TIBC suggestive of IDA which was treated with oral or parenteral iron in addition to erythropoietin. Rest of the patients were purely due to ACD effectively treated with erythropoietin alone. Hence analysing the cause for anaemia of chronic disease is very important as the treatment of underlying disease will improve the haemoglobin. Anaemia of CKD can be effectively treated using erythropoietin. But iron can be supplemented if there is coexistent iron deficiency anaemia.⁸

Other similar studies also showed that anaemia of chronic disease as the predominant cause of anaemia in elderly. A study done in the US by Joosten et al⁹ regarding causes of anaemia in geriatric hospitalised population showed similar results. About 30-45% of anaemia were due to CKD, 15-30% were iron deficiency anaemia, 5-10% were due to vitamin B12 deficiency, 5% were due to chronic leukemia and lymphoma 5% were due to myelodysplastic syndrome and 15-20% was unexplained anaemia.

Out of the 37 cases of iron deficiency anaemia, 62% were due to nutritional deficiency and 38% were due to chronic blood loss. Nutritional deficiency was attributed to poor food intake, duodenal disease and poor socioeconomic status. Hence this should be diagnosed, and iron supplements should be started, as this can improve the quality of life substantially.

Common causes of chronic blood loss were identified as erosive gastritis, duodenitis, peptic ulcer and haemorrhoids. UGI scopy and colonoscopy was found to be useful investigative tool for diagnosing the source of blood loss.¹⁰

In this study 16 cases had macrocytic anaemia out of which 9 patients had vitamin B 12 deficiency (less than 200 pg/ml).¹¹ Out of these 9 cases, 4 were strict vegetarians and 5 were chronic alcoholics. The other causes of macrocytic anaemia in our study were due to hypothyroidism, cirrhosis of liver, myelodysplastic syndrome and HIV infection.

In another study by Amit Bhasin et al⁵ the most common anaemia was found to be ACD (48%) out of which 22% were found to have CKD followed by IDA (34%) which is consistent with our study. Macrocytic anaemia in this study was 6% in contrast to our study which had 16% cases probably because of more pure vegans in our study population.

CONCLUSIONS

Anaemia is an important cause of mortality and morbidity in the elderly. Characteristics of anaemia in elderly by systematic algorithm will help to identify and formulate the appropriate management which would definitely improve the quality of life. In our study, we identified the most

common cause of moderate to severe anaemia in elderly hospitalised population as anaemia of chronic disease in which anaemia of CKD is the predominant cause followed by gastrointestinal malignancies. Iron deficiency and vitamin B12 deficiency were the next common causes of moderate to severe anaemia in the elderly in which nutritional deficiency was common. Fatigue was the major presenting symptom of anaemia in the elderly population which should not be ignored. Ferritin and TIBC can be effectively used to differentiate iron deficiency and anaemia of chronic disease. Hence, individualised approach to every anaemic individual and appropriate specific treatment strategy should be the focus of treatment of anaemia especially in elderly population.

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