



## Study of Anaemia in Elderly

### KEYWORDS

Anemia, elderly, fatigue, frailty.

#### Priti Dave

Professor, Department of Medicine, Bharati Vidyapeeth Medical College and Deemed University, Katraj-Dhankawadi, Pune 411043.

#### Arundhati Diwan

Professor and Head, Department of Medicine, Bharati Vidyapeeth Medical College and Deemed University, Katraj-Dhankawadi, Pune 411043.

#### Rohit Gosavi

Post Graduate Student, Department of Medicine, Bharati Vidyapeeth Medical College and Deemed University, Katraj-Dhankawadi, Pune 411043.

#### Prajakta Patil

Post Graduate Student, Department of Medicine, Bharati Vidyapeeth Medical College and Deemed University, Katraj-Dhankawadi, Pune 411043.

#### Md. Mustaque

Post Graduate Student, Department of Medicine, Bharati Vidyapeeth Medical College and Deemed University, Katraj-Dhankawadi, Pune 411043.

**ABSTRACT** In India the size of elderly population is fast growing. Anaemia in elderly should not be considered as an unavoidable outcome of ageing. We studied the clinical profile, characterization and the nearest etiology of anaemia in 100 elderly patients admitted in our institute. Fatigue was the commonest symptom with which anaemic elderly presented to us. The most frequent morphological type of anaemia was normocytic normochromic (after excluding chronic kidney disease), in which the commonest aetiology was anaemia of chronic disease.

#### Summary

It is a challenge to find the aetiology of Anemia in elderly as many comorbidities are associated in this age group. It should not be merely thought to be due to ageing. Treating anemia in elderly according to the aetiology goes a long way in improving the overall outcome and quality of life.

### Introduction

The number of elderly globally is projected to grow from an estimated 524 million in 2010 to nearly 1500 million in 2050, with most of the increase in developing countries. According to United Nations Development Programme (UNDP) Report 2011, the share of India's elderly is projected to climb from 8% in 2010 to 19% in 2050. The elderly now comprise 8.1% of the total population (census 2011).<sup>1</sup>

There is a wide variation in prevalence of anemia in elderly ranging from 2.9% to 61% in men and 3.3% to 41% in women.<sup>2</sup> WHO criteria determines anemia when the hemoglobin level is < 13g/dl in male and < 12 g/dl in female.<sup>3</sup> Anemia in elderly may lead to increased morbidity, mortality and hamper quality of life more as compared to the young population in view of many associated comorbidities in geriatric population.

### Aims and Objectives

1. To study the clinical profile of anaemia in elderly.
2. To study the common types of anaemia in the elderly.
3. To study the nearest possible etiology of anaemia in elderly.

### Method and Material

The study was a cross sectional prospective study carried out in 100 patients above the age of 60 years of either sex suffering from anaemia, who were admitted in Bharati Hospital and Research Center during a period of two years. Patients were diagnosed as having anaemia on the basis of WHO criteria of anaemia, with haemoglobin less than 13mg/dl in males and haemoglobin less than 12mg/dl in females. Patients with chronic kidney disease and those

on Vit- B12 injections, oral iron and folic acid supplements were excluded from the study.

A detailed history was taken with special emphasis on fatigue, pale skin, anorexia, palpitation, headache, breathlessness on exertion, yellow sclera, imbalance during walking, bleeding per rectum or hematemesis. A detailed general and systemic examination of the patients was undertaken. Special emphasis was also given to tachycardia, pallor, jaundice, oedema, lymphadenopathy, functional cardiac murmurs, splenomegaly and hepatomegaly. Laboratory investigations such as complete blood count, total leucocyte count (TLC), differential leucocyte count (DLC), platelet count, erythrocyte sedimentation rate (ESR), mean corpuscular volume (MCV), mean corpuscular haemoglobin concentration (MCHC), mean corpuscular haemoglobin (MCH), packed cell volume (PCV), reticulocyte count, peripheral blood smear, urine and stool examination specially for occult blood and parasites, renal function test and blood sugar test were done in all the patients. Electrocardiogram, Chest X-Ray and ultrasonography for abdomen and pelvis were also done in all patients. On the basis of blood indices patients were divided into following groups- Microcytic Hypochromic (MCV, MCH, MCHC all reduced), Normocytic Normochromic (MCV, MCH, MCHC normal), Macrocytic (MCV raised), Normocytic hypochromic (MCV normal, MCH, MCHC reduced). Normal Values – 1. Mean Corpuscular Volume (MCV) - 79-93.3 fl. 2. Mean corpuscular hemoglobin (MCH) - 26.7-31.9 pg/dl. 3. Mean corpuscular hemoglobin concentration (MCHC) - 323-359g/L.<sup>4</sup>

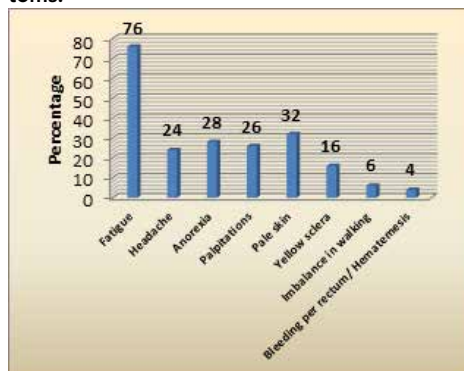
Serum iron, serum ferritin and total iron binding capacity (TIBC) were done for all patients of microcytic hypochromic anaemia. Serum vitamin B<sub>12</sub> and folic acid levels were done in all cases of macrocytic and dimorphic anemia and

in whom no other cause could be found. Additional investigations were done as indicated for underlying cause like upper gastrointestinal (GI) scopy, bone marrow aspiration/biopsy, serum electrophoresis, colonoscopy, anti-nuclear antibodies (ANA). Patients were also evaluated for underlying malignancy if there was suspicion of the same, based on clinical symptoms, laboratory parameters or imaging studies. The clinical profile, morphological character and closest possible aetiologies were studied. Patients were treated for anaemia according to aetiology.

### Results

It was observed that out of 100 elderly patients with anaemia majority of patients were in the age group 66-70 years (36%) followed by 60-65 years (26%). The mean age of the patients was  $69.21 \pm 8.68$  years and male to female ratio was 1.27:1. The most common addiction among patients was tobacco chewing (26%) followed by alcohol drinking (22%). 72% of patients had no addictions. It was observed that fatigue was the commonest symptom (76%) with which patients presented. The other symptoms among patients were anorexia (28%), headache (24%), palpitations (26%) and bleeding per rectum/hematemesis (4%).

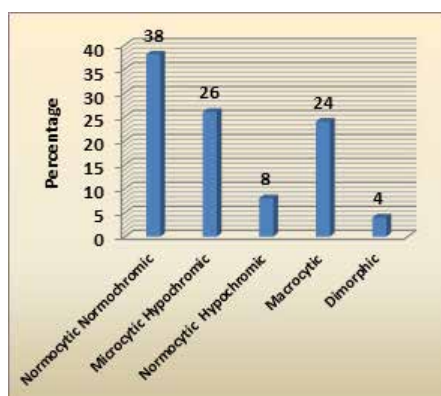
**Figure1: Distribution of Patients according to symptoms.**



It was observed that tachycardia was the commonest sign (36%) The other signs were pallor (35%), jaundice (22%), edema (16%), cardiac murmurs (06%) splenomegaly (04%) and hepatomegaly (03%).

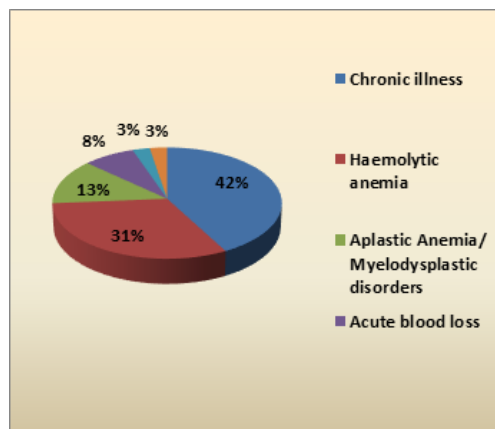
The major pattern of anemia among patients was normocytic normochromic (38%) followed by microcytic hypochromic (26%). The normocytic hypochromic, macrocytic and dimorphic anemia pattern was observed in 8%, 24% and 4% patients respectively.

**Figure2: Distribution of Patients according to Pattern of anemia.**



In our study, chronic illness (42.11%) was the major cause of normocytic normochromic anemia. Among 38 patients with normocytic normochromic anemia 31.58% had hemolytic anemia, 13.16% had aplastic/myelodysplastic anaemia. Endocrine disorders, unexplained anaemia and acute blood loss were seen in 2.63% each and 7.89% respectively.

**Figure3: Patients according to etiology in Normocytic Normochromic pattern.**



Distribution of patients according to etiology in Microcytic Hypochromic pattern suggested that iron deficiency including blood loss was the major cause (80.76%). Among 26 patients with microcytic hypochromic anemia, 15.38% had chronic illness and 3.85% patients had unexplained anaemia. There were no patients with sideroblastic anemia and thalassemia.

As far as etiology of Macrocytic anaemia was concerned, B12 deficiency was the major cause (75%). Among 24 patients with macrocytic anemia 16.67% had chronic illness and 8.33% had folic acid deficiency. It was observed that in patients with iron deficiency anemia, malnutrition was the major cause (61.90%). Among 21 patients 19.04% had peptic ulcer and 9.53% had variceal bleeding and gastrointestinal malignancy each. It was observed that tuberculosis was the major cause for chronic illness anemia (50%). Among 16 patients with chronic illness; 18.75% had carcinoma while Rheumatoid Arthritis, liver cirrhosis, lymphoma and myeloma were observed in 6.25% patients each.

### Discussion

It was observed that fatigue was the commonest presenting symptom (76% of patients) and tachycardia the commonest sign (36% of patients) in our study of anaemic elderly. Similarly in study by KG Prakash et al<sup>4</sup> and Amit Bhasin et al<sup>5</sup>, the most common presentation was easy fatigability (88% and 74% respectively). Symptoms of anaemia generally are not specific, many times develop insidiously leading to adaptation. In elderly it can be assigned to aging or can be attributed to associated comorbidities. Frequently, patients have signs of a disorder that is made worse by the anaemia such as worsening congestive heart failure, cognitive impairment, dizziness and apathy.<sup>6</sup> Aging and the development of age-related comorbidities has been associated with chronically increased levels of proinflammatory cytokines, such as TNF, IL-6, IL-1 $\beta$ , macrophage migration inhibitory factor (MIF), and acute phase proteins.<sup>7</sup> Anemia and inflammation are strongly associated with, and may contribute to, the development of "frailty," a poorly defined syndrome of the elderly population as-

sociated with weight loss, impaired mobility, generalized weakness, and poor balance.<sup>8</sup>

When oxygen carrying capacity of Haemoglobin is reduced due to anaemia to that extent that compensatory mechanisms are not able to correct it, tissue hypoxia develops leading to impairment of functions of many systems. The degree of functional impairment of individual tissues depends largely on their oxygen requirements, and thus symptoms referable to systems with high requirements, such as the skeletal musculature during activity, the heart and the central nervous system, are particularly prominent.<sup>9</sup> Hence it explains fatigue as a common symptom of anaemia in our study.

Hemoglobin levels decline with age and there is an argument whether haemoglobin levels should be lowered to say anaemia in elderly. Many feel it should not be lowered as elderlies are associated with increased morbidity.

The major character of anaemia was normocytic normochromic (38%) followed by microcytic hypochromic (26%) in our study. The normocytic hypochromic, macrocytic and dimorphic anemia pattern was observed in 8%, 24% and 4% patients respectively. In the study by Saurabh R Shrivastava et al<sup>10</sup> all the types of anemia based on peripheral smear were evident, normocytic normochromic being the commonest constituting 78.05% like in our study, followed by microcytic hypochromic 11.6%, macrocytic 6.02% and dimorphic 4.24%. It was observed that chronic illness was the major cause for normocytic normochromic anemia (42.11%) others being hemolytic anemia (13.58%) and aplastic/myelodysplastic (13.16%) anaemia. Similar findings were seen in study conducted by K.S. Lamsal<sup>11</sup> who observed that among the 71 patients having normocytic normochromic blood picture, 8 had hemolytic anemia, 11 had aplastic anemia and remaining were having anemia of chronic disease. The haematologic abnormality in anaemia of chronic disease is an impaired ability to use the iron stored in the reticuloendothelial system. The reason the reticuloendothelial cells do not release iron is not known, but experts speculate that, similar to fever, this response aids the body's defense mechanism.<sup>12</sup> Iron that is held in the reticuloendothelial system is not available for bacterial growth nor is the iron available for erythropoiesis, which is the similarity between anemia of chronic disease and iron deficiency anemia.

It was observed that iron deficiency including blood loss was the major cause for microcytic hypochromic anemia (80.76%) in our study. Others were chronic illness (15.38%) and unexplained anemia (3.85%). Similar findings were seen in study conducted by K.S. Lamsal<sup>11</sup> who observed that blood loss and iron deficiency was the main culprit for microcytic hypochromic anemia morphology. Among 140 cases, variceal bleeding leading to anemia was seen in 52 cases, nonsteroidal anti-inflammatory (NSAID) drug-induced GI bleeding in 22 cases, peptic ulcer in 18 cases and hookworm infestation in 6 cases, nutritional iron deficiency and anemia of chronic diseases in remaining cases.

It was observed that B12 deficiency was the major cause for macrocytic anemia (75%). Among 24 patients with macrocytic anemia 16.67% had chronic illness and 8.33% had folic acid deficiency. Similar findings were seen in study conducted by K.S. Lamsal<sup>11</sup> who observed that among the 26 cases having macrocytic picture in peripheral blood smear, 11 had megaloblastic changes in bone marrow examination. Out of them, 6 had vitamin B12 and 5 had

folate deficiency. Remaining 15 patients having macrocytic picture were having associated chronic illness.

It was observed that malnutrition was the major cause for iron deficiency anemia (61.90%) in our study. Among 21 patients 19.04% had peptic ulcer 9.53% had variceal bleeding and gastro intestinal malignancy each. In the study done by Liu K et al<sup>13</sup> the commonest cause of iron deficiency anemia was faulty nutrition followed by blood loss from lesions in the gastrointestinal tract.<sup>18</sup> Iron deficiency, particularly in elderly person often points out to an underlying gastrointestinal pathology, including malignancy, NSAID-induced gastritis, diverticuli or angiodysplasia. Older persons may become iron deficient because of inadequate intake or inadequate absorption of iron. It was observed that tuberculosis was the major cause for chronic illness anemia (50%). Among 16 patients with chronic illness; 18.75% had carcinoma, 12.0% had Rheumatoid Arthritis and liver cirrhosis, lymphoma and myeloma was observed in 6.25% patients each.

Determination of the underlying cause of anemia in geriatric persons is complicated by comorbidity and polypharmacy, which are particularly common among in the elderly<sup>2</sup>. This must also be taken into account when classifying and comparing the results.

## Conclusion

We concluded that fatigue was one of the common symptoms with which elderlies with anaemia present. In our study normocytic normochromic anaemia was the commonest pattern of anaemia in which chronic illness was the commonest etiology. The second common pattern of anaemia was microcytic hypochromic anaemia with iron deficiency including blood loss anaemia as the commonest etiology. A systematic approach for diagnosing the aetiology of anaemia in elderly patients is essential, as treatment of anaemia goes a long way in improving the overall outcome and quality of life. The non-specific symptoms like fatigue and weakness should not be ignored in the geriatric population as they could be important pointers towards presence of anaemia in these patients.

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