MORPHOLOGICAL PATTERN OF ANAEMIA IN GERIATRICS: HOSPITAL BASED STUDY OF 126 CASES

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ABSTRACT

BACKGROUND
Anaemia is a common public health concern in geriatric age group (More than 60 yrs. of age) and can have significant morbidity and mortality. WHO criteria to determine anaemia is hemoglobin level <13g/dl in male and <12 g/dl in female.

AIM
To study the morphological patterns of anaemia in geriatrics.

MATERIAL AND METHODS
A total of 126 patients above the age of 60 yrs. were included in the present study from Jan 2015 to Dec 2015. Detailed laboratory studies were done.

RESULTS
Out of 126 anaemic patients the commonest age group was between 60-70 yrs. with male preponderance. Majority of patients had Microcytic Hypochromic anaemia followed by normocytic normochromic anaemia. Hence, identifying morphological type of anaemia is absolutely essential for further identification of the cause and treatment.

CONCLUSION
Confirming the prevalence and morphological patterns of geriatric anaemia is important to further investigate the etiology and to reach at a confirmative diagnosis, which ultimately helps in the management of anaemia and the underlying cause.

KEYWORDS
Anaemia, Hemoglobin, Geriatric, Morphological, Diagnosis.

INTRODUCTION: Anaemia is a common public health problem in geriatric age group. In this age group it can have significant complications than in the younger adults and can greatly hamper the quality of life.[1] Twenty percent of all hospital admissions among the elderly are due to anaemia. Anaemia is not a diagnosis in itself, but merely an objective sign of the presence of underlying disease.[2] Studies indicate that the prevalence of anaemia increases with advancing age. Females are more anaemic under the age of 75 years and males are more anaemic over the age of 75 years.[3] Despite the high prevalence of anaemia in the elderly and the increasing size of the geriatric population,[4] only few studies are available in the literature. According to WHO criteria anaemia is defined as haemoglobin level <13 g/dl in males and <12g/dl in females.[5] NHANES-III of WHO study revealed the prevalence of anaemia as 11% in men and 10.2% in women aged >65 years.[6] According to Shirakura et. al haemoglobin less than 11grams/dl can be considered as criterion while dealing with anaemia in geriatrics or elderly, regardless of gender. Most common causes of geriatric anaemia are Anaemia of chronic disease, haematological malignancy like Multiple myeloma, chronic myeloid leukaemia, acute myeloid leukaemia and chronic lymphocytic leukaemia and Chronic blood loss.[7]

Confirming the type of anaemia is critical in identifying the cause for anaemia which helps in management of clinically suspected case of anaemia and who presented with fatigue and pallor and improving the quality of life.[8]

AIMS AND OBJECTIVES: To study the morphological patterns of anaemia, to know the common pattern of anaemia, to know the distribution of morphological patterns in males and females in geriatric patients at district hospital, KIMS, Koppal.

MATERIALS AND METHODS: In this study 126 patients who were diagnosed to have anaemia after Haemoglobin estimation were included who had low Haemoglobin levels,

which based on WHO criteria of anaemia, according to which anaemia is defined as haemoglobin level <13g/dl in males and <12g/dl in females.[5] The present study conducted at Koppal Institute of Medical sciences, Dept. of pathology between Jan 2015 to Dec 2015. Relevant clinical history, age, sex, personal history and history of associated diseases were noted. Blood samples were collected in EDTA tubes and analysed within 4 hours of collection. Haemoglobin, Mean Corpuscular Volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC) and red cell distribution width (RDW), Total leukocyte count, Differential Leucocyte Count, Erythrocyte Sedimentation Rate (ESR) and Platelet count were estimated using auto analyser. Peripheral blood smears were made of patients with low haemoglobin, based on the WHO criteria, mentioned above, smears stained with Leishman's stain and field's stain then examined under oil immersion lens of microscope to determine the patterns of anaemia. Patterns of anaemia were classified based on RBC indices and further correlated by peripheral smear. Microcytic hypochromic anaemia was defined as MCV below 80 fL, normocytic as MCV between 80fL and 100 fL and MCV >100fLas macrocytic anaemia. These values were correlated with peripheral smear examination.

RESULTS: In the present study age of patients ranged between 60-90 years. The mean age was found to be 73 years. Maximum number of patients with anaemia were in the age group of 60-70 years. Age and gender distribution of anaemia in our geriatric patients is listed in Table No.1 and chart No.1. Out of 126 anaemia patients 56.3% (71 of 126 patients) were males and 43.6% (55 of 126) were females. Microcytic hypochromic anaemia was the most common type followed by normocytic normochromic anaemia, dimorphic anaemia, macrocytic anaemia and normocytic hypochromic anaemia. Haemoglobin was reduced in all the case and was 4.5 to 10.5 Gram/dl, MVC, MCH AND MCHC were reduced in microcytic hypochromic anaemia cases. MCV was increased in macrocytic and dimorphic anaemia cases. RDW was increased in all cases of our study. Distribution of pattern of anaemia in our geriatric patients is listed in Table no.2 and in Chart No. 2.

Age group	Male	Female	Total No.
60-70Yr	59(46%)	43(34.12)	102(80.95)
71-80Yr	11(8.7)	10(7.9)	21(16.66)
81-90Yr	10(0.8)	2(1.5)	3(2.3)
Total	**71(56.34)**	**55(43.6)**	**126(100)**

Table 1: Distribution of age and sex in present study
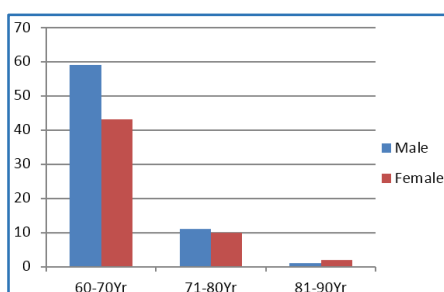
Chart 1: Distribution of age and sex in present study

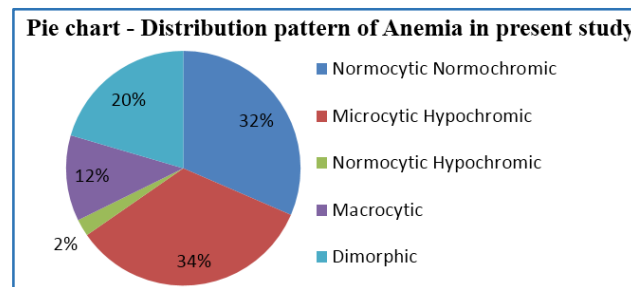| Pattern of anaemia	Number of cases	Percentage (%)
Microcytic Hypochromic	43	34.1
Normocytic Normochromic	40	31.7
Normocytic Hypochromic	3	2.3
Macrocytic	15	11.9
Dimorphic	26	20.6
Total	**126**	**100**

Table 2: Distribution patterns of anaemia

Chart 2: Distribution patterns of anaemia.

DISCUSSION: Anaemia is a common condition among community dwelling older adults with prevalence estimated to be 9-18% in men and 8-13% in women.[9]

The mean age group in various international studies was 75.9 to 76.9 years and in Indian studies it was found in the range of 70.5-73 years which is earlier than others countries.[7] In a study conducted at Varanasi the mean age of the patients was 64.6 years. This is due to lower life expectancy in Uttar Pradesh. (life expectancy~62.6) In Western countries (Switzerland 79.6 years, USA 77.1 years, Singapore 80.1 years). In our study the mean age of the patients was 70 years and this is due to higher life expectancy in Karnataka (67.9 years).[7]

Decline of haemoglobin and concomitant increased anaemia with advancing age should not be presumed to be a result of "normal aging" or due to nutritional deficiency and blanket treatment with haematinics should be avoided before proper investigation.[10] Detection of morphological type of anaemia in an elder should prompt appropriate clinical attention for further investigations.

Microcytic Anaemia: Out of 126 patients 43(34.1%) had microcytic hypochromic anaemia. Common causes of anaemia in geriatric age group are nutritional deficiency like iron deficiency anaemia, acute and chronic blood loss, malignancy etc. The major cause in younger women is menstruation, in non- menstruating women and in men, the most common source is gastrointestinal bleeding. It is important to include serum Iron profile study, Stool examination, Gastro Intestinal Endoscopy as a part of investigations in elderly anaemic patients with Microcytic hypochromic pattern to rule out the cause for the anaemia. Table no. 3 shows cases of Anaemia of chronic disorders.

The underlying diseases in elderly patients with anaemia include, Anaemia of chronic diseases like malignant tumours, Infectious diseases, Gastro intestinal haemorrhage, Renal diseases, haematological diseases, Rheumatoid arthritis,

Liver diseases like Chronic hepatitis, Cirrhosis, Thyroid abnormalities, Bone fractures and other causes like Non-steroidal anti-inflammatory drugs(NSAID) induced Gastritis [7]etc same are listed in table no. 3.

Etiological factor leading to anaemia[7]	
Neoplastic	Anaemia of hematological malignancy Carcinoma rectum Carcinoma Stomach Secondaries Bone marrow infiltration by malignant cells etc.
Infections	Tuberculosis Kala azar Pneumonitis Other Parasitic Infestations
Inflammations	Rheumatoid arthritis Ill-defined illness Systemic Lupus erythematosus, Mixed connective tissue disorder, Polymyositis, Vasculitis etc.
Kidney Disorders	Chronic Renal Failure-Renal Anaemia.
Endocrinal diseases	Hypothyroidism, Adrenal gland dysfunction, Hypopituitarism, Hyperparathyroidism, Gonadal dysfunctions.
Other causes	Non-steroidal anti-inflammatory drugs causing Gastritis or Gastric ulcers
Table 3: Important etiological factor leading to anaemia in Geriatrics[7]	

Normocytic Anaemia: Out of 126 patients 40(31.7%) patients had normocytic normochromic anaemia. It can be due to acute bleeding, uraemia etc., so it is valuable to rule out the acute bleeding from Gastro intestinal tract or any other site. Coagulation profile, Stool examination, Reticulocyte count renal parameters like Serum. Creatinine, Blood Urea, and other relevant investigations can be done to rule out the exact cause for the anaemia.

Macrocytic Anaemia: Out of 126 patients 15(11.9%) had macrocytic anaemia. Vitamin B12 deficiency, Folate deficiency, Liver diseases and Myelodysplastic syndrome are causes of macrocytic anaemia.[11] Serum B12 and Folic acid levels, Liver function tests, Lactate dehydrogenase, Bone Marrow studies etc. are important to identify the cause for macrocytic anaemia. MCV increases slightly with increasing age but usually not enough to produce significant macrocytosis.[10]

Dimorphic Anaemia: Present study revealed 26(20.6%) patients have dimorphic anaemia out of 126 patients. It could be due to nutritional deficiencies or other causes mentioned above in the list leading to dual deficiencies, further investigations are required to rule out the cause.

Study by Chebbi et al out of 184 patients 102 patients aged 65 years 58 were men (56.9%) and 44 were women (43.1%) were diagnosed as microcytic hypochromic anaemia.[12] Which correlates with our study, as microcytic hypochromic anaemia was the commonest cause in our study group with the age group between 60-70 yrs in which 23 were men (53.4%) and 20 were women (46.51%).

In a study by Bhasin A et al, the most common pattern of anaemia was normocytic normochromic in 60-69 years age group.[10] The present study closely resembles with this study. In the present study percentage of anaemia was least common among 80-90(2.3%) years followed by 70-80(16.66%) years age and the most common age group of 60-70 years (80.95%). Microcytic hypochromic anaemia was the commonest cause in the present study.

Niessenson et al study revealed that prevalence of anaemia in geriatrics was 7.5% in males and 20% in females,[13] But present study revealed prevalence of anaemia in geriatrics is 56.34% in males and 43.6% in females.

Geriatric anaemia is unique because it is common in elderly males whereas the anaemia of younger age group is common in females. Cessation of bleeding in elderly women may be the contributing factor for this observation and Mclennan et. all observed 0.6 grams/dl increase per decade in post-menopausal women.[7] In the present study there was a male preponderance (54.34%) when compared with females (43.6%) which correlates with the survey conducted by third national nutritional examination survey (NHANES III) in which incidence of anaemia is more common in males (11%) when compared with females (10%) older than 65 years of age, In study conducted by Niesseson et.al, male preponderance was observed, similarly in the studies conducted by

Bhasin et. al (52% Males, 42% in females) and Vijai Tilak et.al (67.7% in Males, 32.3% in females) were also observed male preponderance which correlates with the present study.[7]

Other study groups have reported that some proportion of unexplained anaemia cases are caused by Myelodysplastic syndrome (MDS), another common haematological condition in elderly which needs to be investigated.[7]

The maximum number of cases in the both studies (Bhasin et al[10] and Srivastava et al[5]) was 60-69 years which is in agreement with our study.

Dharmarajan et al found maximum number of cases anaemia in the age group 70-79 years[14] and Tay et al found maximum number of anaemia cases in the age group of 75-84 years.[15]

Our study hence highlights that most of the anaemic elderly might have an underlying treatable cause for anaemia. It is essential to aware of the coexistence of anaemia in elderly, although the presenting manifestation may be for a different reason. Comprehensive geriatric assessment essentially should include clinical review for presence of anaemia and associated signs to reflect the possible aetiology. It must be followed by peripheral smear examination to know the morphological type of anaemia which helps in the further investigation and management.

CONCLUSION: Microcytic hypochromic anaemia was the commonest pattern in the geriatric patients presented with anaemia, followed by normocytic normochromic anaemia in our study. In contrast to anaemia of younger population, in geriatrics it is more common in males when compared with the females. Failure to evaluate anaemia in elderly could lead to delayed diagnosis of potentially treatable conditions. Nonspecific 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 which reflect the underlying disease. It is necessary to evaluate the morphological pattern of anaemia by means of peripheral smear examination in each patient with low haemoglobin, which guides for the further investigation to evaluate the possible underlying fatal disease causing anaemia, thus helps in its management. It is valuable to include investigations like Iron profile, Vitamin B12 levels, Folic Acid Levels, LDH, Renal profile, Liver function tests, Reticulocyte count, Gastro intestinal Endoscopy, Bone Marrow study etc. depending upon the Morphological Pattern of Anaemia in geriatric patients.

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