Pathology

Clinical and Hematological Evaluation of Anemias in Geriatric Age Group

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Abstract: Anemia in the geriatric population is a very widespread trouble. It can be associated with mortality in spite of the core health condition. It is more important to find the cause and type of anemia for treatment and prevention purpose. Despite the high prevalence of anemia in the elderly and the increasing size of geriatric population, very few studies have examined the effects of anemia in elderly patients especially in India. Hence, our aim is to study the clinico-hematological patterns of anemia in the elderly and to detect the morphological types of anemia prevalent among the elderly in the age group of 60 years to 90 years. The present study is aimed at a detailed clinic-pathological evaluation of anemia in the geriatric population in the Department of Pathology, SVS Medical College & Hospital, and Mahabubnagar during the period of two years between October 2014 to September 2016.
Keywords: Microcytic anemia, megaloblastic anemia, pancytopenia, bone marrow.

INTRODUCTION

Anemia in the elderly is an extremely common problem and it can cause more severe complications than in the younger adults[1]. Anemia is common and multifactorial condition in older population[2]. It is often associated with mortality and poorer health related quality of life, regardless of the underline cause of the low hemoglobin[1-4]. It is easy to overlook anemia in the elderly since symptoms like fatigue, weakness or shortness of breath may be attributed to aging process itself and should never be accepted as an inevitable consequence of aging. Results from a number of studies have shown that anemia has a substantial negative impact on function as well as the quality of life[5].

Aging by itself is unlikely to cause anemia. Though anemia is an extremely common problem in the elderly, it often remains under-diagnosed and is not reported to the patient because it is mostly perceived as a mere consequence of aging. Hence, anemia is recognized as a significant and independent contributor to morbidity and mortality in the elderly patients, regardless of the underlying cause.[4] Failure to evaluate anemia in the elderly may lead to delayed diagnosis of potentially treatable conditions. Therefore, it becomes all the more important to look for the type and severity of anemia and its etio-pathogenesis in order to plan for better prophylactic and management strategies.

MATERIALS AND METHODS

The present study was conducted in the Department of Pathology, S V S Medical College and Hospital, Mahabubnagar. The period of prospective study was from October 2014 to September 2016 on 200 subjects in the age group of 60 years to 90 years with anemia and also on those who presented with other complaints but were incidentally found to have anemia.

The patients were divided into following groups
Group I: 60-70 Years
Group II: 70-80 Years
Group III: 80-90 Years

Inclusion criteria
- Age 60 years to 90 years (All inpatient and outpatient).
- Hb level less than or equal to 12.00 gm/dl in male.
- Hb level less than or equal to 11.00 gm/dl in female.

Exclusion Criteria
- Age below 60 years and above 90 years.
- Hb level more than 12.00 gm/dl in male.
- Hb level more than 11.00 gm/dl in female.
- Patients who had received blood transfusion in the recent past.
- Patients on treatment for anemia.
- Patient diagnosed with hematological malignancies.

- Patient who have undergone major surgery in past 3 months.

After eliciting the detailed history, a thorough clinical examination was undertaken and data was recorded in the proforma. 10 ml of venous blood from the antecubital fossa was collected in EDTA (Ethylene diaminetetraacetic acid) tubes. The collected blood was analyzed using Sysmex-XS 800i, an automated cell counter having five part differentials. In this instrument, the blood cell counting is based on the impedance principle with both the cell counts and histograms obtained through the analysis of blood cell dilution.

DISCUSSION AND RESULTS

The study was conducted in the Department of Pathology, SVS Medical College and Hospital, Mahabubnagar, T.S from October 2014 to September 2016 on 200 subjects in the age group of 60 years to 90 years with anemia and also on those who presented with other complaints but were incidentally found to have anemia.

Age (in years) distribution of study patients

Age (in years)	No. of patients	Percentage (%)
60 - 70	140	70.00
70 - 80	50	25.00
80 - 90	10	5.00
Total	200	100.00

Maximum number of patients found to be in the age group between 60 to 70 years. The present study showed that maximum numbers of subjects were in the age group of 60 - 70 years (70%), followed by 70 - 80 years (25%) and 80 - 90 years (5%). The present study was close to the study done by Gangadharan V *et al.* which showed that 59% of the study subjects were in the age range of 60 - 70 years, 30% were in the age group of 70 – 80 years and 11% were in the age group of 80 – 90 years[6]. The present study was not in accordance with the study done by Sgnaolin V et al which showed less prevalence of anemia in the age group of 60 - 70 years and the prevalence was higher in over 80 years old[7].

Gender distribution of study patients

Gender	No. of patients	Percentage
Male	110	55.00
Female	90	45.00
Total	200	100.00

Male patients were found to be more anemic compared to females. The present study showed male predominance (55%) as compared to females (45%), which was not similar to the study done by Sgnaolin V *et al.*[7] which showed female predominance. Another study done by Guralnik JM showed male predominance as compared to females which was similar to the present study[8]. Similar study was done by Patel et al showed male patients were more compared to female patients among the study samples which was similar to the present study[2]. In contrast a study performed by family health program of PERNANVUCO, Brazil found that average prevalence of anemia in women was 51.4% where as it was found to be 48.6% in men[9].

Peripheral Blood Smear (PBS) pattern

PBS Findings	No. of patients	Percentage
Normocytic normochromic anemia	100	50.00
Microcytic hypochromic anemia	24	12.00
Dimorphic anemia	31	15.50
Normocytic hypochromic anemia	30	15.00
Macrocytic anemia	7	3.50
Pancytopenia	8	4.00
Total	200	100.00

The present study was in similarity with the study done by Gangadharan V *et al.*[6] who found that normocytic normochromic anemia blood picture as far more common in elderly patients followed by microcytic hypochromic anemia blood picture. The similar studies were also shown by Bhasin A *et al.* [10], Dungca JZ *et al.* [11], Bach *et al.* [4]and Ania *et al.* [12] The study done by Sgnaolin V

showed that maximum patients had normocytic normochromic anemia which suggests a diagnosis towards anemia of chronic disease. Similar study was also done by Govindaraj T *et al*. who also showed maximum number of patients suffering from normocytic normochromic anemia blood picture followed by microcytic hypochromic anemia blood picture[1]. Usually normocytic normochromic anemia blood picture is found in anemia of chronic diseases like chronic kidney disease, chronic obstructive pulmonary disease, tuberculosis, and chronic blood loss conditions like hemorrhoid[13].

Causes of anemias in study patients

Causes	No. of patients	Percentage
Anemia of chronic disease	156	78.00
Iron deficiency anemia	30	15.00
Other nutritional deficiency anemia	10	5.00
Bleeding	4	2.00
Total	200	100.00

The study done by Joosten E *et al*. was concurrence with the present study which showed chronic diseases were the most common cause of geriatric anemia followed by iron deficiency anemia as the second major cause of anemia[14]. The study done by Riva E *et al*. showed that beta thalassemia minor was having 20.8%, Iron deficiency was having 28.2%, and due to chronic disease was 28.1% and other nutritional deficiency 11.0% [15] which showed quite similar result to the present study. The present study showed no cases of thalassemia minor or thalassemia major in the study subjects. In contrast the study done by the Third National Health and Nutrition Examination Survey (NHANES III) from 1991 to 1994 found nutritional deficiencies to be the most common form as compared to others (34.3%).[16] A study conducted by Bernard M *et al*. found iron deficiency anemia more among the study samples which is not concurrent to the present study. [17]

Association between grading of anemias with age (in years)

		Anemia Grade			Total	P-Value
		I	II	III		
Age (in Years)	60 - 70	40	90	10	140	0.002
	70 - 80	4	34	12	50	
	80 - 90	1	7	2	10	
	Total	45	131	24	100	

The present study showed that maximum numbers of subjects were in the age group of 60 - 70 years (70%), followed by 70 - 80 years (25%) and 80 - 90 years (5%). The present study was close to the study done by Gangadharan V *et al*. which showed that 59% of the study subjects were in the age range of 60 - 70 years, 30% were in the age group of 70 – 80 years and 11% were in the age group of 80 – 90 years[6]. The present study was not in accordance with the study done by Sgnaolin V et al which showed less prevalence of anemia in the age group of 60 - 70 years and the prevalence was higher in over 80 years old[7]. The difference in the results could be due to variation in the sampling and sample size[7]. In the present study the mean age of both male and female was 68.3 years. Also the mean age of male and female was 68.3 years. The present study showed male predominance (55%) as compared to females (45%), which was not similar to the study done by Sgnaolin V *et al*. [7] which showed female predominance. Another study done by Guralnik JM showed male predominance as compared to females which was similar to the present study[8]. Similar study was done by Patel *et al*. showed male patients were more compared to female patients among the study samples which was similar to the present study[2]. In contrast a study performed by family health program of PERNANVUCO, Brazil found that average prevalence of anemia in women was 51.4% where as it was found to be 48.6% in men[9]. The probable explanation could be due to decreased estrogen activity in the post menopausal women that is similar to those in men, which increases the erythropoiesis, subsequently decreasing the risk of anemia.

ANEMIA AND SMOKING CORRELATION

Cigarette smoking causes numerous diseases that are associated with anemia but resulting low hemoglobin levels may be counter balanced by increased red blood cell production caused by chronic exposure to carbon monoxide from cigarette smoke. Diverse mechanisms are involved in influencing the development or the course of anemic disease in smokers[18].

	Present study (Mean hemoglobin)	Nordenberg *et al.*[19] (Mean hemoglobin)
Smokers	7.9 gm/dl	4.8 gm/dl
Non smokers	8.6 gm/dl	8.5 gm/dl

Nordenberg, Yip and Binkin [19] showed that among anemic patients of comparable socio economic status, the mean hemoglobin level was 4.8 gm/dl in smokers and 8.5 gm/dl in individuals who have never smoked[19].

SUGGESTIONS FROM THE PRESENT STUDY
- The importance of the assessment of anemias in aged patients lies in the detection of co-morbidities.
- Anemia in aged individuals is a common, under-appreciated and potentially morbid condition.
- However, public health improvement for the anemic elderly involves a complex set of scientific, clinical and societal issues.
- It is advised to distinguish between anemias on the basis of red blood cell indices and other special examinations.
- Assessment of iron stores is important for most patients, as is assessment for evidence of inflammation. Other tests may be useful as well based on the data.
- Mortality condition is more frequent in anemic individuals rather than non anemic.
- Patients with anemia should be investigated and treated by a multidisciplinary team that includes a pathologist.
- The aim is to make a correct diagnosis as soon as possible and guide the treatment plan.
- It has been found that there are very limited number of studies on the frequency of the most common signs and symptoms of anemia in the elderly individuals. Further studies are required in this area.

SHORTCOMINGS OF THE STUDY
- Limited sample size: More studies should be done in the Indian population with a larger sample size so that proper preventive measures can be advised for the aged population.
- Longitudinal studies should be done to evaluate the mortalities in the elderly so that proper measures can be taken to avoid those mortality rates in the elderly population.
- The present study was a hospital based study, but it is found that the actual aged people suffering from anemias are situated more in remote villages. Hence, there is a need for more number of studies in remote villages and rural areas so that the needy people can be benefitted.

CONCLUSION
Despite the modern diagnostic advances, geriatric anemia still remain under reported and inadequately investigated, especially when mild, thereby necessitating evaluation of even mild anemias in this vulnerable population. Identifying anemia is an important aspect of a comprehensive assessment. It is absolutely essential for the further clinical detection. Confirming the type of anemia is critical to direct the investigation for profiling the etiology since it is well known that the treatment of anemia goes a long way in improving the overall outcome and quality of life.

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