



Clinicohematological Profile of Anemia in Hospitalized Elderly Patients

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ABSTRACT-

All elderly patients more than 60 years of age admitted in a tertiary care centre over a period of two years. It is a hospital based cross-sectional study in the department of medicine over a period of two years from October 2010 to October 2012 in which 116 patients were included in the study.

Anemia is a common concern in older people and can have significant morbidity and mortality. Because anemia is a sign, not a diagnosis, an evaluation is almost always warranted to identify the underlying cause. The purpose of this study was to study the clinical profile of elderly patients with anemia and to study characteristics of haematological types of anemia in such patients as well as the closest possible etiological profile.

The maximum number of patients (49 males and 31 females) was in age group of 60-69 years. The mean Haemoglobin in present study for males was lower (8.94 ± 1.98 gm/dl) as compared with female patients (9.12 ± 1.83 gm/dl). Normocytic anaemia was the most common anaemia with 61.21% followed by Microcytic anaemia 18.1% followed by Macrocytic and Dimorphic anaemia 12 (10.34%). Number of male patients were more in each type of anaemia especially normocytic anaemia though in Microcytic anaemia number of female patients were more. The most commonly observed etiological factor was Chronic Kidney Disease (43.96%), followed by Pulmonary Koch (14.65%) and Alcoholic liver disease (10.34%). Rest of the etiological factors occurred in less than 10% of the cases.

Key Words: anaemia, elderly, etiology.

INTRODUCTION

Advances in medical science have resulted in a significant rise in elderly population. According to estimates in the next 30 years the number of older persons will nearly quadruple growing from about 600 million to almost 2 billion people. Today 1 in every 10 is 60 years and older. By 2050, 1 out of every 5 will be an older person and by 2150 one third of the people in the world are expected to be 60 years of age and older¹. Anaemia is common in the elderly and its prevalence increases with age². In this population it can have significantly more sever complication, can greatly hamper the quality of life.

Using World Health Organization criteria for anaemia (Haemoglobin of less than 12gram/dl in women and less than 13gram/dl in males), the prevalence of anemia have shown an incidence ranging from 6% to 30% for men and 10% to 22% for women. There is often the impression that there is anemia of senescence and that in the older patient, a mild anaemia is especially is likely to reflect a physiological rather than pathological process. Consonant with this belief, suggestions have also been made that evaluation in the elderly should only begin when the anaemia is at least moderate (less than 10gm/dl), since workup of mild anaemia may produce a poor yield of identifiable causes. Conversely, others have stated that anemia should always be regarded as being pathological and hence evaluated so as not to miss any underlying treatable conditions especially in their early stages³.

Although studies have been made in other countries, but there have been few domestic

studies on anaemia in the hospitalized elderly. This study was undertaken to present some Indian data on the subject.

AIMS AND OBJECTIVES

To know the severity, typing and cause of anaemia in hospitalized elderly patients.

MATERIALS AND METHODS & STATISTICAL ANALYSIS

Study design: - Hospital based cross sectional study was carried out in a tertiary care centre over a period of two years from 2010 to 2012 with prior approval from the institutional ethics committee. All patients gave their informed consent prior to their inclusion in the study. Patients age above 60 yrs & above of either sex presenting our hospital, fulfilling the WHO criteria of anaemia hemoglobin (Hb) < 13 in males, Hb < 12 in females. A total 116 patients were studied.

The data obtained on demographic and haematological variables were analyzed according to objectives of the study. The summary statistics like mean, standard deviation and percentages were obtained considering the measurement scale of the variables. Chi-square test was used to determine the association between categorical variables. In case of contingency tables with cell values less than 5, simulated p-value was obtained using Monte-Carlo approach. To determine statistical significance of difference of mean of various haematological parameters across types of anaemia, one-way ANOVA was used. For comparing these parameters between genders, t-

test for independent samples was used. The significance level used in the study was 5% and the entire analysis was carried out using R-2.15 statistical package.

The following haematological investigations were carried out for all patients – Hb total leucocyte count (TLC), differential leucocyte count (DLC), erythrocytic sedimentation rate (ESR), platelet count, blood urea, serum creatinine, mean corpuscular volume (MCV), mean corpuscular hemoglobin concentration (MCHC), mean corpuscular hemoglobin (MCH), packed cell volume (PCV), reticulocyte count, peripheral smear for blood picture and serum ferritin. Bone marrow studies (aspiration/biopsy) were carried out in patients with blood smear showing immature white cells or nucleated red cells, indeterminate status of iron stores and unexplained progressive or unresponsive anaemia. Vitamin B 12 and folate assays were done for dimorphic and macrocytic anaemia or in patients with normocytic or microcytic blood picture in whom no other cause could be found. Additional investigations as indicated for detection of underlying cause—chest X-ray, ultrasonography (USG) of abdomen and pelvis, stool for parasites and occult blood upper gastrointestinal (GI) endoscopy. An upper GI endoscopy was carried out in all patients with iron deficiency. An endoscopy was also done in patients in whom stool occult blood was positive, or an underlying cause could not be evaluated. Patients were also evaluated for an underlying malignancy if there was suspicion of the same, based on clinical symptoms, the underlying etiology.

RESULT

In our study population, age of the patients ranges from 60 to 80 yrs. Mean age was 71.51 yrs, maximum numbers of patients were in the age group of 60-69 (49 were males & 31 were females.) –Fatigue was the most common symptom found in 70% patient, palpitation & anxiety were the next common symptoms which were present in 10% patient. Severity of anaemia according to haemoglobin level, Moderate grade of anaemia was the most common degree of anaemia 43.97% followed by mild degree of anaemia (41.37%). Anaemia characterisation on peripheral smear showed that the normocytic anaemia (61.21%) is most common type followed by microcytic (18.1%), macrocytic (10.34%) who were deficient both in vit B12 folic acid & dimorphic (10.34%).

In this study observable most common etiological factor was chronic kidney disease (43.96%) followed by pulmonary Koch's (14.65%) and alcoholic liver disease (10.34%).

Below table no 1 gives the distribution of patients according to age and sex. Majority (68.9%) of the sampled subjects were in the age group of 60 – 69 years.

Table 1: Distribution of patients according to age and sex

Age group (years)	No. of patients	Sex	
		Male	Female
60-69	80 (68.9%)	49	31
70-79	26 (22.4%)	12	14
> 80	10 (8.6%)	5	5
Total	116	66 (56.89%)	50 (43.1%)

Below Table No 2 reveals that ‘Normocytic’ anaemia (61.21%) is the most common type of anaemia followed by ‘Microcytic’ which was 18.1%.

Table 2: Distribution of patients as per typing of anemia

Type of anemia	No. of patients (%)
Microcytic	21 (18.10%)
Macrocytic	12 (10.34%)
Dimorphic	12 (10.34%)
Normocytic	71 (61.21%)
Total	116

Table 3: Distribution of cases according to etiological factors and type of anaemia

Etiological factor	Type of anemia				Total
	Normocytic	Microcytic	Macrocytic	Dimorphic	
Chronic Kidney Disease	45	6	0	0	51 (43.96%)
Pulmonary Koch	12	2	0	3	17 (14.65%)
Alcoholic liver disease	1	1	6	4	12 (10.34%)
Rheumatoid arthritis	7	0	0	3	10 (8.62%)
Malarial fever	0	6	0	0	6 (5.17%)
Acquired Immunodeficiency Syndrome	0	1	2	1	4(3.44%)
Carcinoma Stomach	1	1	0	0	2(1.72%)

Chronic Pancriatitis	0	0	2	0	2(1.72%)
Chronic Lymphocytic Leukemia	0	0	1	1	2(1.72%)
Abdominal Koch	1	0	0	0	1(0.86%)
Atrophic gastritis	0	0	1	0	1(0.86%)
Bronchogenic Carcinoma	1	0	0	0	1(0.86%)
Carcinoma Cervix	0	1	0	0	1(0.86%)
Carcinoma Oesophagus	0	1	0	0	1(0.86%)
Chronic Myeloid Leukemia	1	0	0	0	1(0.86%)
Dengue fever	0	1	0	0	1(0.86%)
Drug induced Aplastic Anemia	1	0	0	0	1(0.86%)
Gastro Esophageal Reflux Disease	0	1	0	0	1(0.86%)
Small cell Lymphoma	1	0	0	0	1(0.86%)
Total	71 (61.2%)	21(18.1%)	12(10.34%)	12(10.34%)	116

DISCUSSION

Anaemia is a common concern in geriatric age , in this population it can have significantly sever complications. The prevalence as anaemia has been found to range from 8 to 44%¹³, highest prevalence in men who are 85 yrs older. Multiple pathophysiological abnormalities in a single patient are well known of any abnormality contribute. The study comprised of 116 elderly anaemia patients, majorly (68.9%) of the patients were in age group of 60-69%.

Proportion of males in this group was higher (61%) as compared to females (39%). In the older

age groups, the proportions were almost the same.

Overall, proportion of males was 57% compared to females with 43%. Similar results were found in study done by Challand GS et al⁴ who found out that the prevalence of anaemia in elderly is higher in men 20.1% and 13.7% in elderly women. In another study by Jack MG et al⁵ revealed that overall 11% of men and 10.2% of women 65 year old and older are anaemic. Celestian Roux et al⁶ also reported that there is high prevalence for men in all age group ranging from 42.8% in men aged between 70-74 years to 59.5% in men 85 years.

. Moderate grade of anaemia was the most common degree of anaemia 43.97% of patients followed by mild degree of anaemia (41.37%). There is no reduction of Haemoglobin linearly with age. The association between severity and gender in different age groups was statistically insignificant with *p*-value of 0.9075. Ersher WB et al⁷ found out that there is Haemoglobin decline and anaemia prevalence rises in men and women with advancing age Overall mean SD of age in males was 66.04 ± 5.91 years and that in females was 67.08 ± 7.56 years. Kin H et al⁸ which revealed that prevalence of anaemia by age group was lowest among age group 60-69 year (10%) followed by 70-79 year (15.5%) and highest among age group over 80 year (20.7%).

Table No 2 reveals that 'Normocytic' anaemia (61.21%) is the most common type of anaemia followed by 'Microcytic' which was 18.1%.

The proportion of males in all type of anaemia was on higher side especially in normocytic category but in microcytic anaemia number of female patients is more.

Above table provides the mean levels of different parameters across anaemia types. It is evident that mean MCV was highest in Macrocytic group (107.58 ± 5.82 unit?), while the lowest mean was observed in Microcytic group (65.62 ± 3.01). The difference across groups was found statistically significant with *p*-value of 0.0003. Further, mean MCH was found maximum in Dimorphic group (32.97 ± 2.43), while in Microcytic group, the mean was lowest (24.41 ± 0.94). In present study normocytic anaemia (61.21%) is the most common type of anaemia followed by microcytic

anaemia (18.1%) Elis et al⁹ also stated that in elderly patient normocytic anaemia is the most common type of anaemia.

In this study 12 patients who had Macrocytic anaemia who were deficient both in vitamin B₁₂ and Folic acid similarly in Dimorphic anaemia all the 12 patients were deficient in both vitamin B₁₂ and folic acid. The statistical association between B₁₂ levels and type of anaemia was determined using *Chi-square test* with simulated *p*-value. The test resulted into highly significant association between the two variables with *p*-value < 0.0001. All microcytic 21 (100%) patients and dimorphic anaemia 12 patients (100%) group is deficient in serum iron including 66 patients (92.95 %) in normocytic anaemia while all the 12 patients (100%) in macrocytic group was within normal limit. Serum iron was found below 41 ng/ml in majority i.e. 99 (85.35%) cases, while remaining 17 (14.65%) had level in the range 41-141 ng/ml. Serum ferritin in all Normocytic Normochromic Anaemia 71 (100%) patients was within normal limit. While all 21 (100%) Microcytic anaemic patients and 12 (100%) patients in dimorphic anaemia group were deficient in serum ferritin. All 12 (100%) patients in macrocytic anaemia had normal levels serum ferritin levels. As regards TIBC values were high in all 21 (100%) microcytic anemic patients and 12 (100%) patients in Dimorphic anaemia group but within normal limits in all 12 (100%) patients in macrocytic anaemia and all 71(100%) normocytic anaemia group.

Above table no3 shows that the most commonly observed etiological factor was Chronic Kidney

Disease (43.96%), followed by Pulmonary Koch (14.65%) and Alcoholic liver disease (10.34%). Rest of the etiological factors occurred in less than 10% of the cases. Similar results were found in studies done by Matzner Y et al¹⁰ who found out that chronic kidney disease (4) as the most common cause of anaemia in elderly patients followed by metastatic carcinoma and Gastrointestinal bleed (3 each). In another study done by Joosten et al¹¹ found out the common cause of anaemia in 178 hospitalized elderly patients was chronic disease (355), iron deficiency (15%) and unexplained causes (17%). The prevalence of anaemia was 11%, in a study carried out by Ferruci L et al¹² in 964 subjects older than 65 years in a northern Italy population study.

CONCLUSION

Our study hence highlights the fact that most of the anemic elderly have an underlying treatable cause for Anaemia. It is essential therefore that the treating physician is aware of the coexistence of Anaemia in elderly, although the presenting manifestation may be for different reason. It becomes, therefore, all the more pertinent to look for severity and type of anemia, possible etiologies and appropriate correction. As normocytic anemia is the most common blood smear diagnosis, it is important to bear in mind that normocytic blood picture in an anemic elderly should not be disregarded.

Appropriate attention should also be paid towards diet and nutrition of the geriatric population. It is advisable to evaluate each anaemic patient carefully, irrespective of the screening costs,

provided that the diagnostic tests chosen are appropriate, reasonable and justified. Given the association of anaemia with poorer quality of life, comprehensive geriatric assessment essentially should include clinical review for presence of Anaemia and associated signs to reflect the possible etiology.

BIBLIOGRAPHY

1. Aggarwal KK. "Care for elderly", Post Grad Med (Ind Ed.) Vol.4, oct.2003.
2. Smith DL. Anemia in the elderly, Am Fam Physician, 62:1565-1572, Oct. 2000.
3. Mansouri A, Lipschitz DA. Anaemia in the elderly patient Medical Clinics of north america Vol.76, No., 619-630, May 1992.
4. Challand GS, Michailoudis A, Watfa RR. Distribution of haemoglobin in patient presenting to general practitioner and its correlation with serum ferritin. Ann Clin Biochem 1990; 27: 15-20.
5. Guranlik Jack M, Eisenstaedt RS, Luigi Ferrucci. "Prevalence of anaemia in person 65 years and older adults". Blood Oct 2004; 104; 2263-8.
6. Celestin-Roux C, Hale WE, Perkins LL. "Anemia: an evaluation of age, sex, disease and medications in a geriatric population". J Geriatr Drug Ther 1987; 1: 63-86.
7. Ershler WB, Sheng S, McKelvey J, et al. Serum erythropoietin and aging: a longitudinal analysis. *J Am Geriatr Soc.* Aug 2005; 53(8):1360-5.

8. S. H. Lee, W. N. Erber, International Council for Standardization in Hematology guidelines for the standardization of bone marrow specimen and reports. *Intl.Jnl.Lab.Hem.* 2008, 30, 349-364.
9. Elis A, Ravid M, Manor Y, Bental T, Lishner M. Additional approach to 'idiopathic' normocytic normochromic anaemia? *J Am Geriatr Soc.* 1996;44:832-4
10. Matzner Y, Levy S, Grossowicz N, Izak G, Hershko C. Prevalence and Causes of anaemia in elderly Hospitalized patients, *Gerontology* 25:113-119, 1979
11. Joosten E, Pelemans W, Hiele M, Noyen J, Verhaeghe R, Boogaerts MA. Prevalence and causes of anaemia in a Geriatric Hospitalized Population, *Gerontology* 38:111-117; 1992
12. Ferruci L, Guranlik JM, Bandinelli S, et al. Unexplained anaemia in older persons is characterised By low Erythropoietin and low levels of proinflammatory