Anemia in Adult Men in a Tertiary Health Care Centre – A Cross Sectional Study

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Abstract

Introduction- Anemia is characterized by a decrease in the concentration of red blood cells (RBCs) or a low hemoglobin concentration in the blood. It can lead to insufficient oxygen delivery to tissues and organs, affecting their normal functioning. There is a need to focus on anemic men, who are equally vulnerable as they will have consequences that disturb the quality of life affecting the total productivity.

Objectives - We aimed to evaluate anemia in adult men in a tertiary health care centre.

Methods- A cross sectional study on 116 adult anemic males.

Results- We found that alcoholic liver disease was most common, followed by sickle cell disease, chronic kidney disease, acute leukemia , pancreatitis, acute gastritis, acute lung disease, type 2 diabetes millitus with systemic hypertension, acute kidney disease, diabetes ketoacidosis with sepsis and haemorrhoids.

Conclusion- Anemia is the common co morbidities, present with easy fatigability, loss of appetite and generalized weakness. Etiological factors should be kept in mind before starting specific therapy. Anemia affects the quality of life, healthcare resources utilization, cost, mortality and causes economic loss due to lower productivity in manual occupations.

Introduction

Anemia is characterized by a decrease in the concentration of red blood cells (RBCs) or a low hemoglobin concentration in the blood. It can lead to insufficient oxygen delivery to tissues and organs, affecting their normal functioning. Anemia results from blood loss, decreased red blood cell (RBC) production, poor RBC maturation, or increased RBC destruction. Iron is indeed a critical nutrient during adolescence due to the rapid growth and development that occurs during this life stage especially for girls with the onset of menstruation. Boys also experience significant growth during adolescence, and both genders have an increased demand for iron to support the expansion of blood volume and the synthesis of hemoglobin[1,2]. Anemia during adolescence can indeed have significant impacts on both physical and mental well-being. The effects of anemia can extend beyond fatigue and weakness, influencing various aspects of health and development[2]. Causes of anemia are defective absorption of iron, gastrointestinal bleeding, Crohn's disease, ulcerative colitis, hookworm infestations, neoplasms, respiratory tract diseases and malabsorption syndromes[3].

Importance of anemia in women and children is more because it is associated with adverse effects during pregnancy and early childhood[4]. There is a need to focus on men, who are equally vulnerable. There are consequences that disturb the quality of life affecting the total productivity[5].The main concern is lack of

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awareness for men. Our study focuses on anemia prevalence in males and identify the various etiology.

Materials And Methods

116 Indian adult males with anemia whose complete blood count was received in the of Department of Pathology at a Tertiary Care Hospital, were included in this study.

After the approval of the Institutional Ethics Committee, an Informed written consent for the study was taken from the patient. Blood received in the EDTA tubes was run in the automated five-part hematology analyzer(SIEMENS ADVIA 2120) cell counter. The data of the 116anemic adult males was documented in an Excel sheet along with their clinical details and was analyzed later.

Results

TABLE 1 - Age group in various diseases causing anemia in adult males.

Age Group Disease	21 - 30 years	31 - 40 years	41 - 50 years	51 - 60 years	61 - 70 years	71 years &above	Total
Alcoholic Liver Disease	1	8	7	5	9	3	33
Sickle cell disease	14	5	2	1	0	0	22
Chronic kidney disease	0	2	2	1	4	5	14
Acute leukemia	1	2	1	3	1	2	10
Pancreatitis	0	3	4	2	0	0	9
Acute gastritis	0	1	4	1	1	1	8
Acute lung disease	0	1	1	3	0	0	5
Type 2 diabetes millitus with systemic hypertension	0	0	1	0	3	1	5
Acute kidney disease	0	0	0	1	0	3	4
Diabetes ketoacidosis with sepsis	0	0	1	2	0	0	3
Hemorrhoids	0	0	2	1	0	0	3
Total	16	22	25	20	18	15	116

TABLE 2 –Severity of anemia in various diseases of adult males

Diseases	Mild anemia Hb (10-12.9) g/dl	Moderate anemia Hb (7 - 9.9) g/dl	Severe anemia Hb (<7) g/dl	Total
Alcoholic Liver Disease	4	16	13	33
Sickle cell disease	9	7	6	22

Chronic kidney disease	3	7	4	14
Acute leukemia	1	5	4	10
Pancreatitis	2	4	3	9
Acute gastritis	3	3	2	8
Acute lung disease	1	2	2	5
Type 2 diabetes millitus with systemic hypertension	2	2	1	5
Acute kidney disease	1	3	0	4
Diabetes ketoacidosis with sepsis	1	1	1	3
Hemorrhoids	1	1	1	3
Total	**28**	**51**	**37**	**116**

Table 3- Morphological type of anemia in the adult males

Diseases	Microcytic anemia (MCV < 80 fl)	Macrocytic anemia (MCV >100 fl)	Normocytic (MCV 81-99 fl)	Total
Alcoholic Liver Disease	9	14	10	33
Sickle cell disease	10	3	9	22
Chronic kidney disease	4	2	8	14
Acute leukemia	5	2	3	10
Pancreatitis	4	2	3	9
Acute gastritis	2	1	5	8
Acute lung disease	3	1	1	5
Type2 diabetes millitus with systemic hypertension	1	2	2	5
Acute kidney disease	1	0	3	4
Diabetes ketoacidosis with sepsis	2	1	0	3
Hemorrhoids	2	1	0	3
Total	**43**	**29**	**44**	**116**

Discussion

Anemia is a prevalent condition, and its implications become particularly significant in the elderly population. Anemia in the elderly is a matter of concern due to various serious consequences it can have on health and overall well-being.

We classified anemia on the basis of age group, grades of anemia showing mild anemia (10-12.9 g/dl), moderate anemia (7-9.9 g/dl), severe anemia(<7 g/dl) and the morphological type of anemia showing microcytic (MCV< 80fl), macrocytic (MCV>100fl) or normocytic (MCV 81-99fl)[6].

In our study of anaemic adult males, alcoholic liver disease was the most common cause. The other causes included Chronic kidney disease, Acute leukemia, Pancreatitis, Sickle cell disease, Acute gastritis, Type 2 diabetes millitus with systemic hypertension, Acute kidney disease, Acute lung disease, Diabetes ketoacidosis with sepsis and Haemorrhoids.

We found alcoholic liver disease mostly affected males in the seventh decade, who had a moderate degree of macrocytic anemia. In the study of ,E. Gkamprela et al [7], it was found that, Chronic liver disease was frequently associated with various hematological abnormalities. Anemia is a common occurrence in patients with advanced liver disease. Anemia in alcoholic liver disease is often attributed to the toxic effects of alcohol on the bone marrow. These effects lead to reversible suppression of hematopoiesis, affecting platelet production and function. Patients with alcoholic liver disease may present with malnutrition and deficiencies in essential nutrients, including iron, folate, vitamin B12, and vitamin B6. In the study of Takayo Nagao et al [8] , They classified macrocytic anemia in liver disease into megaloblastic or non megaloblastic. Megaloblastic anemia is associated with deficiencies in vitamin B12 (cobalamin) or folate (vitamin B9), which are essential for DNA synthesis and red blood cell maturation. Non megaloblastic anemia is associated with liver dysfunction, alcoholism, myelodysplastic syndrome (MDS), or hypothyroidism.

In our study sickle cell disease was the second most common cause for anemia. It was seen in the second decade of life with microcytic type of anemia. In

sickle cell anemia, leads to the production of abnormal hemoglobin known as hemoglobin S (HbS).When exposed to reduced oxygen tension red blood cells assume a sickle or crescent shape. The altered, sickle-shaped red blood cells are less flexible and more prone to getting trapped in blood vessels which lead to haemolysis [6] .In the study of Prasad Rao Koduri [9], in sickle cell anemia, iron deficiency is due to excessive urinary losses of iron. This excessive loss is due to chronic intravascular hemolysis.

In our study, kidney disease was mostly seen in age group of 71 years and above and showed normocytic type of anemia. In the study of, Bach et al[10], signs of renal impairment, hyper inflammation, and nutrient deficiencies were evaluated. C-reactive protein was found to be more prevalent in the anemic patients compared to nonanemic patients. Normocytic anemia was the most common type of anemia observed.

In the study of Kiran Aithal et al[11],Chronic kidney disease was the most common cause of anemia followed by cirrhosis of liver , tuberculosis and osteoarthritis which was similar to study conducted by Amit Bhasin et al[12]

Gastritis was one of the causes for anemia in adult males in our study and was most common in age group of 41 to 50 years with microcytic type of anemia. In the studies of TD Jhonson- Wimbley et al and Michael Alleyne et al [13], [14]it was found that decreased iron absorption may be due to atrophic gastritis or malabsorption syndromes.Chronic blood loss from different areas of the body, including the genitourinary (related to the urinary and reproductive systems), gynecological (related to the female reproductive system), and gastrointestinal tracts, can lead to iron deficiency anemia. Gastrointestinal (GI) bleeding is indeed a significant cause of iron deficiency anemia

Diabetes was common in the age group of 41 to 50 years of age, with microcytic type of anemia. Salma M. Al Dallal et al[15] stated the prevalence of anemia is noted to be higher in individuals with poorly controlled diabetes. This suggests that the level of glycemic control in individuals with diabetes is associated with occurrence of anemia. Keane et al [16]stated that reduced haemoglobin levels leads to increased risk for hospitalization and premature death in diabetic patients. Abdulmajeed Hassan Aljohani et

al [17] stated that anemia can be a complication of poorly controlled diabetes mellitus, especially in individuals with long standing or uncontrolled disease. In the study Mehdi et al [18] , Anemia in diabetic patients with CKD was from iron and erythropoietin deficiencies. In the study of E.S. Ford et al [19] , the HBA1c levels were higher in the presence of iron deficiency anemia.

In our study, pancreatitis was common in age group 41 to 50 years of age, with microcytic type of anemia. In the study of Cai et al[20] It is a systemic inflammatory disease, with production of multiple inflammatory cytokines. They limit iron absorption in the intestine, reduce erythropoietin production and inhibit erythrocyte maturation, in turn leads to anemia. It reduces the oxygen-carrying capacity of the blood. Anemia is the prognostic factor in evalualting disease severity for acute pancreatitis.

Haemorrhoids was common in age group 41 to 50 years, with microcytic type of anemia. In the study of Calim et al, Carter D et al,[21, 22]it was common in the fourth decade and was a common cause for lower gastrointestinal bleeding and it is associated with anemia.

We found, Acute lung disease to be common in fifth decade with microcytic type of anemia. In the study ,of Sarkar et al [23], It stated that altered erythropoiesis in COPD can manifest with anemia. Development of anemia depends on the balance between inflammatory stimuli and hypoxic stimuli. In the study of Tao et al,[24] The relationship between anemia and severe outcomes in patients with COVID-19, as well as in those with other respiratory conditions like community-acquired pneumonia, severe influenza, and chronic obstructive pulmonary disease (COPD), is an important area of study and clinical observation. COVID-19 patients, those with anemia have a higher mortality rate compared to those without anemia.

Conclusion

Anemia is one of the common co morbidities present with of easy fatigability, loss of appetite and generalized weakness. We found that Alcoholic liver disease wasthe leading cause of anaemia in males with moderate degree of macrocytic anemia. Second most common cause was Sickle cell disease with microcytic type of anemia. Other causes were kidney

disease, Acute leukemia, Pancreatitis, Acute gastritis, Sickle cell disease, Type 2 diabetes millitus with systemic hypertension , Acute lung disease, Diabetes ketoacidosis with sepsis and Haemorrhoids.

Etiological factors should be kept in mind before starting specific therapy. Anemia affects quality of life, healthcare resources utilization, cost, mortality and economic loss due to lower productivity in manual occupations. Hence, awareness about anemia in males should also be spread among the population.

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