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Haematological Manifestations In Alcoholics In Comparison With Non Alcoholics

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Abstract
Background – alcohol is one of the most widely consumed substances, and its effects include alterations in the complete blood count (cbc). The primary factors causing these changes in cbc are: myelosuppression , which leads to a slight reduction in all blood cell types, gastrointestinal bleeding, and malnutrition. Individuals with alcoholism may experience moderate anemia, marked by enlarged and structurally abnormal red blood cells (rbcs); a slight decrease in white blood cells (wbcs), particularly neutrophils; and a moderate to severe reduction in platelets.
Aim: this study aimed to investigate the hematological manifestations in moderate and severe alcoholics, considering the quantity and duration of alcohol consumption, and to compare these findings with those in non alcoholics.
Material and method: a cross-sectional study was conducted for a period of one year in our medical college hospital in medicine opd with the collaboration of department of pathology and biochemistry. The study was started after getting the approval from the institutional ethical committee. A total of 75 study subjects were included in the study in which 25 were non-alcoholics, 25 were moderate alcoholics (less than or equal to two drinks per day for men and less than or equal to one drink per day for women) and the remaining 25 were severe alcoholics (more than 7 drinks a week in women and more than 14 drinks in a week in men). Complete blood count-haemoglobin, red blood count, packed cell count, mean corpuscular volume, mean corpuscular haemoglobin, mean corpuscular haemoglobin concentration, total count, platelet count, peripheral blood smear. Liver function test-total bilirubin, direct bilirubin , serum glutamate aspartate transferase, serum glutamate oxaloacetate transferase, albumin, alkaline phosphatase. Bone marrow examination in alcoholics with pancytopenia
Results: hemoglobin,mean rbc count, platelet count were normal among the non alcoholic group and it started decreasing among moderate alcoholics and more so with severe alcoholics and difference was found to be statistically significant.
Conclusion: alcoholism is more prevalent among men, middle-aged individuals, and those in lower socioeconomic groups. Chronic alcoholics often suffer from anemia, which correlates with the severity of alcohol consumption and can manifest as various types, including macrocytic anemia. Thrombocytopenia is also common, but the hematological issues can be reversed with abstinence; early detection and treatment can prevent severe complications and reduce mortality rates

Keywords – *alcoholics, hematological manifestations, non alcoholics*

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I. Introduction

The consumption of alcoholic beverages dates back to the dawn of civilization in ancient Egypt. Evidence suggests that the first alcoholic drink was consumed at least as early as 6000 BC, And since then, alcohol has been consumed globally. Alcoholism is a major global public health issue And is the third largest risk factor for disease burden worldwide. Approximately 2 billion people are Classified as alcohol consumers, and 76.3 million individuals suffer from alcohol use disorder. The Effects of alcohol vary based on the amount of ethanol consumed per kilogram of body weight, with levels of 0.02 to 0.03 g/dl being reached after one or two standard drinks.Alcohol use disorder (AUD) is defined by experiencing at least two of eleven alcohol-related Difficulties within a twelve-month period. In most Western countries, the lifetime risk for developing An AUD is about 10-15% for men and 5-8% for women, with genetic factors accounting for about 60% of this risk. Factors that increase the risk of liver disease in alcoholics include the quantity and Duration of alcohol intake, sex (with females being twice as susceptible as males), co-infection with Hepatitis C, genetic factors, malnutrition, obesity, smoking, and iron overload. Alcohol consumption Is associated with significant morbidity and mortality, posing a serious global health hazard. Hematological changes often go undetected and untreated, potentially leading to cardiac failure.Alcohol is one of the most commonly used drugs, and its consequences include changes in the Complete

blood count (CBC). Heavy alcohol use can cause various metabolic disturbances, Necessitating the investigation of CBC changes. Alcohol consumption can adversely affect blood cells And their functions. The primary causes of changes in CBC include myelosuppression, Gastrointestinal bleeding, and malnutrition. Chronic excessive alcohol intake reduces the number of Blood cell precursors in the bone marrow, causing structural abnormalities and resulting in fewer or Non-functional mature blood cells. Consequently, alcoholics may suffer from moderate anemia Characterized by enlarged and structurally abnormal red blood cells (RBCs); a mild reduction in white Blood cells (WBCs), particularly neutrophils; and a moderate to severe reduction in platelets. Although this generalized reduction in blood cell numbers (pancytopenia) is usually reversible with Abstinence and not typically fatal, complex hematopoiesis aberrations can develop over time and May be fatal. Currently, few studies have been conducted in India to compare hematological manifestations Among alcoholics and non-alcoholics. Therefore, this study aims to assess and compare blood Parameters between these two groups, which could help in early detection and prevention of Serious complications related to alcohol consumption

II. Materials And Methods

Study Design: Cross sectional study.

Study setting: patients who presented to out patient department in maharajah's institute of medical sciences , nellimarla and consent was taken from cases before commencing the study.

Sample size: 75

Study Period: JANUARY 2023 TO JUNE 2023

Subject And Selection Criteria :

The following information was collected from all patients 1.Demography-name, age, gender, occupation, socio-economic status, date of admission and Discharge. 2. Present History- Jaundice, pain abdomen , abdominal distention bilateral pedal edema, Malena, haematemesis, fever, altered sensorium. 3. Alcoholic history-amount of alcohol taken ,number of days taken in a week, 4. Group-moderate or severe. General Physical Examination-icterus, Clubbing, pedal edema pallor, lymph nodes. Signs of liver cell failure like palmar erythema , loss of axillary hair, Dupuytrens contracture, parotid swelling, breast atrophy, testicular atrophy.Systemic Examination-Per abdomen, Central nervous system, Respiratory System and Cardiovascular System were examined in detail by – inspection, Palpation ,percussion and auscultation. Investigations-Information was collected for following investigations . Complete blood count-Haemoglobin, red blood count, packed cell count, mean corpuscular volume, mean Corpuscular haemoglobin, mean corpuscular haemoglobin concentration, total count, platelet count, peripheral Blood smear. Liver function test-Total bilirubin, direct bilirubin , serum glutamate aspartate transferase, serum Glutamate oxaloacetate transferase, albumin, alkaline phosphatase. Bone marrow examination in alcoholics with Pancytopenia

Statistical Analysis :

The statistical analysis was performed using students 't' test to compare mean values of variables in non-alcoholic and alcoholic people.The correlations were assessed by Pearson rank correlation coefficient. Differences were considered statistically significant when $p<0.001$.

Inclusion Criteria :

25 adult patients who are moderate alcoholics(less than or equal to two drinks per Day for men and less than or equal to one drink per day for women) .25 patients who are severe alcoholics (more Than 7 drinks a week in women and more than 14 drinks in a week in men). .25 adult patients who are non Alcoholics taken as control

Exclusion Criteria :

All patients who are less than 18 years. Patients with other hepatic disorders. Patients receiving hepatotoxic drugs

III. Results

Gender distribution of study population.

Gender	Alcoholics		Non-Alcoholics	
	No	%	No	%
Male	35	70.0	19	76.0
Female	15	30.0	6	24.0
Total	50	100.0	25	100.0

Samples are gender matched with P=0.585

Age incidence of study population.

Age in years	Alcoholics		Non-Alcoholics	
	No	%	No	%
21-30	5	10.0	1	4.0
31-40	13	26.0	6	24.0
41-50	18	36.0	7	28.0
51-60	9	18.0	7	28.0
60 & above	5	10.0	4	16.0
Total	50	100.0	25	100.0
Mean ± SD	36.04±11.28		48.64±11.35	

Samples are age matched with P=0.351

Duration of consumption of alcohol.

Duration in years	Number	%
1-10 years	15	30.0
11-20 years	15	30.0
>20 years	20	40.0
Total	50	100.0

Mean ± SD: 15.46±8.18

Comparison of complete blood picture in moderate and severe alcoholics with non Alcoholics

Complete Blood count	Alcoholics (n=50)		Non-Alcoholics (n=25)	Significance
	Moderate	severe		
Hemoglobin	9.58+_1.34	8.59±2.27	11.63±2.1	F=5.473;p=0.006**
Total count	8026.92±3388.52	11620.83±7310.56	7276.8±1970.48	F=5.890;p=0.004**
RBC	2.78±0.81	2.72±0.75	2.82±0.78	F=0.106;p=0.899
MCV	90.99±11.38	93.86±9.52	80.31±10.52	F=11.399;p<0.001**
MCH	27.97±5.63	29.07±4.05	29.50±3.99	F=0.735;p=0.483
MCHC	28.59±3.78	28.18±4.4	28.21±3.01	F=0.095;p=0.910
PCV	27.52±6.52	28.45±3.89	26.52±2.49	F=1.058;p=0.352
Platelet counts	2.00±0.65	1.88±0.73	2.32±0.65	F=2.844;p=0.065+

Hemoglobin levels in moderate and severe Alcoholics

Hemoglobin levels	Moderate Alcoholic (n=26)	Severe Alcoholic (n=24)
<10 gms	15 (57.7%)	15 (62.5%)
>10 gms	11 (42.3%)	9 (37.5%)

Comparison of blood smears in moderate and severe alcoholics.

Peripheral Blood smear	Moderate Alcoholic (n=26)	Severe Alcoholic (n=24)
NORM NORM BLOOD PICTURE	5 (20%)	8 (16%)
NORMO NORM ANEMIA	7 (14%)	13 (26%)
MACROCYTIC ANEMIA	4 (8%)	9 (18%)
MICRO HYPO ANEMIA	9 (34.6%)	5 (20.8%)
DIMOR ANE	1 (2%)	2 (3%)

Comparison of blood smears in alcoholics and non alcoholics.

PBS	Alcoholics (n=50)	Non-Alcoholics (n=25)	Significance
NORMOCYTIC NORMOCHROMIC ANEMIA	20 (40.0%)	21 (84.0%)	<0.001**
MACROCYTIC ANEMIA	13 (26.0%)	1(4.0%)	<0.001**
MICROCYTIC HYPOCHROMIC ANEMIA	14 (28.0%)	3(12.0%)	0.085+
DIMORPHIC ANEMIA	3(6.0%)	0	0.235
THROMBOCYTOPENIA	5(10.0%)	0	0.432
PANCYTOPENIA	2(4.0%)	0	0.165

IV. Discussion

Alcohol abuse is a growing epidemic in India, especially among men and now a day it is becoming a major Problem among young adults. The clinical manifestations of alcohol-induced hematologic disorders are Profoundly influenced by the patient's social and economic status, and the presence or absence of other factors, Such nutritional deficiency or alcoholic cirrhosis. Most of these changes result, either directly or indirectly, in Anemia and when extensive liver disease is present, the patient may develop an abnormally functioning fibrinogen Or other coagulation disorders, which may initiate or exacerbate bleeding. Studies had shown that even before Anemia appears, approximately 90 percent of alcoholics have a macrocytosis (mean corpuscular volume [MCV] Between 100 to 110 femtoliters [fL]) and it was almost in par with our study where we found mean MCV was 93.86 fl among severe alcoholics and it was very high in comparison with moderate or non-alcoholics.Alcohol-induced macrocytosis occurs even though patients are folate and cobalamin replete and do not have liver Disease. The mechanism is unknown, but it takes two to four months for the macrocytosis to disappear after the Patient becomes abstinent. Changes of RBC from chronic and heavy drinking have been studied in many respects, Not only regarding to changes of the size of RBC(macrocytosis), but even the presence of defectuose RBC in the Blood and their production from the bone marrow. As a result of these changes, anemia is a common finding in Alcoholics. The above statement was very much supported by our study in which we found the mean Hb among The severe alcoholics was 8.59 gm% which was significantly less in comparison with the non-alcoholic group. Anemia was found in approximately 50% of the alcohol abusers in a study performed in Finland.The same Study revealed that elevated MCV and MCH was a common finding among alcohol abusers both in absence, or in Presence of anemia.Our study further proves that thrombocytopenia is common among severe alcoholics as the mean Platelet count was found to be lower than the non-alcoholics and it was almost in par with the studies done by Esmeralda Thoma et al and in another study done in in Kebbi State in Nigeria. A case-control study Performed in Nigeria had observed significant reduction of WBC, RBC, haemoglobin, haematocrit and Platelet count, while MCV values are significantly elevated.Another study done in India had shown a Significant reduction of haemoglobin, RBC, WBC, haematocrit and PLT, while MCV and MCH were Significantly elevated.Thus the complete blood count picture had shown that anemia, leucopenia and Thrombocytopenia are common abnormalities that are associated with alcohol abuse with respect to time Of alcohol abuse and the quantity of alcohol consumed.These findings suggest that alcohol abuse can Cause bone marrow suppression, or ethanol has cytotoxic effects. As the previous studies quoted, the Common clinical manifestations of alcoholism were jaundice, pallor, anorexia, fever, abdominal distension,

V. Conclusion

Alcoholism affects both men and women, though it is more prevalent among men and typically found in Middle-aged individuals. It is also more common in lower socioeconomic groups. Anemia is a predominant Condition in chronic alcoholics and is not necessarily linked to bleeding. The severity of anemia correlates with The severity of alcohol consumption. Alcoholics have a heightened risk of infection. They may exhibit various Types of anemia, including microcytic hypochromic, macrocytic, and normocytic normochromic anemia, with Macrocytes often seen in peripheral blood smears. Thrombocytopenia is another common feature in chronic Alcoholics. The hematological manifestations associated with alcoholism are reversible upon cessation of alcohol

Consumption. Early detection of anemia in alcoholics can prevent severe complications, such as organ failure.Identifying and treating hematological changes early in alcoholics can mitigate further complications and reduce Mortality rates, particularly in lower socioeconomic groups

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