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Medicine

A STUDY ON HEMATOLOGICAL MANIFESTATIONS OF ALCOHOL

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ABSTRACT

Background: *Alcohol consumption is one of the commonly practiced social evils in the new era and is known for morbidity and mortality. Alcohol induced diseases are common and are well documented by many of the earlier studies but only at a later stage. Limited data is available to detect the early alterations caused by Alcohol abuse. Multiple organs can be involved like Hepatobiliary system, Cardio vascular system, Central nervous system, Haemopoietic system.*
Alcohol can lead to all types of anemia with suppression of bone marrow. Many a times hematological changes are left undetected and untreated. Alcoholism is considered a progressive disease, meaning that the symptoms and effects of drinking alcohol become increasingly more severe over time.

Introduction:

Alcohol has been widely consumed through the ages because of its apparent benefits as a social lubricant and for relaxation, mood alteration and sensory pleasure. Alcoholism is more common among men in middle aged group and a feature of lower socio economic group. Compulsive drinking in excess has become modern society's one of the most serious problems[1,2]. Alcoholism is a worldwide social and medical problem. Over the past 30-40 years, alcohol consumption has increased in quantity and frequency. But long-term consumption of large amount is harmful leading to addiction and fatal or non-fatal injuries. In many parts of the world, drinking alcoholic beverages is a common feature of social gatherings. Nevertheless, the consumption of alcohol carries a risk of adverse health[3,4,5] and social consequences related to its intoxication, toxic and dependence-producing properties.

In addition to the chronic diseases that may develop in those who drink large amounts of alcohol over a number of years, alcohol use is also associated with an increased risk of acute health conditions, such as injuries, including from traffic accidents.

Chronic alcoholism occurs with the daily consumption of months and years of significant alcohol intake, compared with the possibility for the person to eliminate the alcohol. All the organs can be damaged due to direct effects of alcohol, especially the digestive and nervous systems. At the level of digestive system, alcohol causes gastrointestinal problems, cirrhosis of liver, pancreatitis and cancer of the mouth, pharynx and the esophagus. Alcohol has numerous adverse effects on various types of blood cells[6,7,8] and their functions. Other secondary effects include loss of appetite, vitamin deficiency, infection, sexual impotence and menstrual irregularities.

Therefore, alcohol use, especially chronic use is related to morbidity affecting many systems in the human body. Studies have suggested that only 20% of alcohol abusers are recognized on routine clinical practice. The diagnosis occur when the adverse effects are already obvious and recognizable.

Effective and low cost methods are now available for identification and treatment of alcohol addiction at an early stage. These methods play an essential role in prevention of alcoholism. They include various hematological[9,10] and biochemical parameters. Some of the commonly studied parameters are Aspartate amino transferase (AST), Alanine amino transferase(ALT), Gamma glutamyl transferase (GGT) and Mean corpuscular volume (MCV).

Combination of one or more of these markers has been reported to give better sensitivity and diagnostic accuracy characterizing the early events leading to alcoholic disease at a later stage. Early identification of alterations in these hematological and biochemical parameters aid in the effective planning and early application of preventive and therapeutic measures to reduce the morbidity and mortality and these are the basis and the need for the study.

Materials and Methods: 50 chronic alcoholics admitted in Chalmeda Anand Rao Institute of Medical Sciences between January, 2014 and December, 2015 included in the study. Depending upon the quantity and duration of alcohol consumption they were categorized to moderate alcoholics and severe alcoholics, each group consists of 25 alcoholics and Hematological parameters were studied in both groups.

1. Inclusion Criteria:
- Patients who are more than 20 yrs old.
- Moderate alcoholics i.e., men who are taking not more than 2 drinks and women who are taking not more than one drink per day.
- Severe alcoholics i.e., men taking more than 6 drinks on single sitting or more than 14 drinks per week and women taking 3 drinks on single sitting or more than 7 drinks per week.

2. Exclusion Criteria:
- Patients age less than 20 yrs
- Patients with known hemolytic anemia and acute bleeding manifestations
- Patients with infectious causes of hematological changes
- Patients with other hepatic disorders
- Patients taking drugs which effect hematological system like aspirin, cytotoxic drugs

Study Design: It is a prospective cross sectional study.
The following information was collected from all patients regarding:-

1. Alcoholic history- amount of alcohol taken, number of days taken in a week and grouped them into-moderate or severe

2. All the patients were subjected for the following investigations:

Complete blood count-Hemoglobin, red blood count, packed cell count, platelet count, mean corpuscular volume (MCV), mean corpuscular hemoglobin(MCH), mean corpuscular hemoglobin concentration(MCHC), total count, platelet count, peripheral blood smear. Liver function tests, Renal function test and Bone marrow examination.

Statistical Analysis: The data collected will be analyzed for descriptive statistical methods like frequency, distribution and association.

Results and Discussion:
Our study consists of 88% males (44 out of 50) and 12% females (6 out of 50).The age group of study ranged from 20 to 70 years ,The maximum incidence (62%) of alcoholism is in the age group of 31-50 years. 96% of patients belonged to low socio-economic group and 4% belonged to middle socio-economic group

In our study most common presentation is distension of abdomen 76% (38/50) followed by in order jaundice 68% (34/50), Bilateral pedal edema 36% (18/50), Pain abdomen 24% (12/50), fever 20% (10/50), hemetemesis 12% (6/50), melena 14% (7/50), breathlessness 10% (5/50), altered sensorium 12% (6/50).

Majority (60%) are anemic (30 out of 50). The average hemoglobin percentage was 9.59gms%. Icterus was present in 38% (19/50). Pedal edema was present in 60% (30/50) of alcoholics. Clubbing was present in 38% (19/50). Parotid swelling was present in 24 %(12/50) of patients. Other features of liver cell failure like palmer erythema, gynecomastia, and spider naevi were seen in 12% (6/50).

In the present study, hepatomegaly suggestive of fatty liver was seen in 34% (17/50), cirrhosis of liver with ascitis was seen in 48% (24/50).Complete cirrhosis with only ascitis was seen in 14% (7/50). The mean hemoglobin was 9.208±2.6918 gms% among moderate alcoholics and 9.564±2.2260 gm% among severe alcoholics. [Table-1]Levels of hemoglobin were not correlating with severity of alcohol.

The total WBC count is correlating with the severity of alcoholics. Mean WBC count in moderate alcoholics was 8116.00±3433.497 and in severe alcoholics was 11380.00±7265.845. The lowest count was 1300 cells/cumm and the highest count was 27500cells/cumm

The mean MCV in moderate alcoholics was 90.828±11.4819fl. In severe alcoholics it was 93.624±9.4036.The highest was 112.1fl.

Significant thrombocytopenia was seen in 12% (6/50) of alcoholics with amean of 1.945±0.6987 lakhs/cu.mm in moderate alcoholics and 1.842±0.7382 lakhs/cu.mm in severe alcoholics. The lowest platelet count was 20,000.cells/cu.mm.

Peripheral blood smear[Table-2] showed all types of anemia. Normocytic normochromic anemia was present in 16% (8/50), microcytic hypochromic anemia in 22% (11/50), Macrocytic anemia in 36% (18/50), dimorphic anemia in 6% (3/50).

Most common anemia seen is Macrocytic anemia in peripheral blood smear. Next is the Microcytic anemia. Normal peripheral smear is seen in 20% (10/50).

Abnormal bone marrow picture [Table-3] was seen in 38% (19/50). Among which megaloblastic picture was seen in 24% (12/50) of alcoholics. Erythroid hyperplasia was seen in 22% (11/50). Vacuolated RBC was seen in 10% (5/50). Sideroblasts was seen in 8% (4/50) of alcoholics.

Conclusions:
• Anemia is the predominant feature among chronic alcoholics. Anemia was independent of bleeding. Severity of anemia did not correlate with the severity of alcohol intake.

• All types of anemia are seen in alcoholics on peripheral smear. The predominant anemia is Macrocytic anemia.
• WBC count is correlating with severity of alcoholism.
• Bone marrow studies reveal predominantly megaloblastic picture. Other features seen were increased vacuolization in pronormoblasts precursors of red bloodcells, erythroid hyperplasia, and Sideroblastic RBCs.
• Thrombocytopenia was also a feature of chronic alcoholics.

Limitations of Study:
1. This study doesn't include chronic alcoholics without systemic manifestations of alcoholism.

2.The study has small sample size hence the observations cannot be extrapolated to alcoholics.

3. Serum B12 and Folic acid levels were not estimated because of economic constraints of the patient.

4. Another limitation is no further follow up done to check for complete abstinence and reversibility of the abnormal peripheral blood smear and bone marrow studies for the patients who wer discharged.

TABLE-1 Hematological parameters	MODERATE ALCOHOLICS	SEVERE ALCOHOLICS	SIGNIFIC ANCE
HEMOGLOBIN	9.208±2.6918	9.564±2.2260	P<0.05
WBC	8116.00± 3433.497	11380.00± 7265.845	P=0.003
RBC CELL COUNT	2.780±0.7665	2.440±0.7897	P<0.05
MCV	90.828±11.4819	93.624±9.4036	P<0.001
MCH	28.01±5.746	28.99±3.987	P=0.04
MCHC	28.47±3.806	28.31±4.362	P<0.35
PCV	28.26±7.263	28.48±3.811	P=0.01
PLATELET COUNTS	1.945±0.6987	1.842±0.7382	P<0.03

TABLE-2 PERIPHERAL BLOOD SMEAR	MODERATE ALCOHOLICS (n = 25)	SEVERE ALCOHOLICS (n = 25)
NORMOCYTIC NORMOCHROMIC THROMBOCYTOPENIA	6	4
NORMOCYTIC NORMOCHROMIC ANEMIA	2	6
MICROCYTIC HYPOCHROMIC ANEMIA	7	4
DIMORPHIC ANEMIA	2	1
MACROCYTIC HYPOCHROMIC ANEMIA	8	10
PANCYTOPENIA	1	1
THROMBOCYTOPENIA	3	3

Table:3 Bone Marrow Examination	Number	Percentage%
Normal	31	62
Abnormal	19	38
Vacuolated RBCs	5	10
Erythroid Hyperplasia	11	22
Megaloblastic picture	12	24
Sideroblastic RBCs	4	8

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