Original Article

Study of Haematological Manifestations, among Alcoholics in Tertiary Care Hospital

Poralla Sammaiah[1], Rajendra Prasad[2], V Chandra Shekhar[2]

[1]Assistant Professor, Department of General Medicine, Kakatiya Medical College/Mahatma Gandhi Memorial Hospital, Warangal, Telangana, India, [2]Professor, Department of General Medicine, Kakatiya Medical College/Mahatma Gandhi Memorial Hospital, Warangal, Telangana, India

Abstract

Introduction: Alcohol consumption is known for morbidity and mortality, being a serious health hazard of the people in the world. Multiple organs can be involved like Hepatobiliary system, cardiovascular system, Central nervous system, Hemopoietic system. Alcohol can lead to all types of anemia with suppression of bone marrow.

Materials and Methods: Hematological parameters of **49** adult patients who are moderate alcoholics, **26 patient**s were severe alcoholics and who were admitted in MGM Hospital, Kakatiya Medical College, Warangal, were included in the study.

Results: Among these 75 patients 60% (45) of the alcoholics had anemia. The mean hemoglobin was 9.2gms% among moderate alcoholics and 9.0gm% among severe alcoholics.

Conclusions: Alcoholism was more common among men in middle aged group and a feature of lower socio economic group. Anemia was a predominant feature among chronic alcoholics. All types of anemia were seen in alcoholics. Microcytic hypochromic anemia, macrocytic anemia, normochromic normocytic anemia.,

Key words: Alcohol, Hematological manifestations, Megaloblastic

INTRODUCTION

Alcoholism represents one of the most serious worldwide socio -economic health problem. An alcoholic is a person who consumes an amount of alcohol capable of producing pathological changes. The amount of alcohol capable of producing diseases, depend on variety of factors including genetic predisposition malnutrition and concomitant viral infection of the liver. According to national council of alcoholism and drug dependence alcoholism is a primary chronic disease with a genetic psychosocial and environmental factors influencing its developmental manifestations. It is characterized by continuous or periodic impaired control over drinking over pre occupation with the drug alcohol and distortion in thinking most notably denial. According to the National Council of Alcoholics, adults who drank in past year 64%1.

Mortality

As per National Council of Alcoholism number of alcohol induced death excluding accidents and homicides 21,081.1 No. of alcoholic liver disease deaths 12,5481 The office for national statistic revealed that number of deaths due to alcohol was 4144 in 19911 have increased to 8386 by 20061. Hence alcohol consumption is known for morbidity and mortality, being a serious health hazard of the people all over the world. Multiple organs can be involved like Hepatobiliary system, cardiovascular system, Central nervous system, Hemopoitic system. Many times the hematological changes are left undetected and untreated which could progress to cardiac failure. Early detection and treatment of hematological changes can prevent complications and reduce the mortality; these are the basis and the need for the study.

Aims and Objectives

To describe hematological changes in alcoholics. To study the hematological changes with respect to the quantity of alcohol consumption and duration of alcohol

Corresponding Author: Dr. Poralla Sammaiah, Department of General Medicine, Kakatiya Medical College/ Mahatma Gandhi Memorial Hospital, Warangal, Telangana, India. E-mail: poralla999@gmail.com

consumption.To compare the hematological changes occurring in moderate and severe alcoholics.

MATERIALS AND METHODS

Source of Data: Patients who were admitted in MGM Hospital, Kakatiya Medical College, Warangal, Telangana state.

Method of Collection Data
Samples Size: 49 adult patients who are moderate alcoholics, 26 patients who are severe alcoholics and 67 Male patients and 8 female patients.

Inclusion Criteria
All patients who are moderate alcoholics that is who consume alcohol less than 80 to 90 mg proof alcohol that is about 11 drinks per day or 80 mg of proof alcohol three or four times a week.

All patients who are severe alcoholics that is who consume more than 80 to 90 mg proof alcohol daily or more than 11 drinks per day Patients attending and admitted Mahathma Gandhi Memorial Hospital Warangal attached to Kakatiya Medical College, Warangal.

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

RESULTS AND ANALYSIS

The Table 1 shows the maximum (68%) alcoholics are from 31 years to 50 years age group.

The Table 2 shows the maximum 89.4% alcoholics were males and 11.6%. are females.

The Table 3 shows the maximum alcoholics 72% (54/75) belongs low socio economic status group.

The Table 4 shows the major complaint are 60% (45/75) from alcoholics, in addition jaundice 40%, pedal edema 28%, pain abdomen 25.%, hematemesis 20%,breathlessness 21%, altered sensorium 21% and 10.6% melena.

The Table 5 shows that maximum 62.6% of alcoholics are above 10 years duration and below 20 years.

The Table 6 shows that 60% of alcoholics are presenting with pallor, in addition icterus 40%, pedal edema 28% and parotid swelling 24% clubbing 20%.

Table 1: Distribution of age in years

Age	Alcoholic	
	No.	%
21-30	13	17.4
31-40	24	32.00
41-50	27	36.00
51-60	11	14.6
Total	75	100.00
Mean±SD	45.34±11.20	

Table 2: Gender frequency distribution among study population

Gender	Alcoholic	
	No	%
Male	67	89.4
Female	8	11.6
Total	75	100

Table 3: Frequency distribution of socio-economic status among the study group

SES	Frequency	Percentages
LowSES	54	72.00
Middle SES	21	28.00
Grand Total	75	100.00

Table 4: Distribution of presenting complaints among the study group

Chief complaints	Alcoholic (n=75)	
	No	%
Jaundice	30	40.0
Pain Abdomen	19	25.33
Dist Abdomen	45	60.00
BilatPedEdma	21	28.00
Hematemesis	15	20.00
Malena	8	10.67
AlteredSensorium	16	21.33
Breathlessness	16	21.33

Table 5: Duration of alcohol consumption inyears among the study group

Duration in years	Number	%
1-10 Years	19	25.33
11-20 Years	47	62.66
>20 Years	9	12.00
Total	75	100

1. The Table 7 shows the maximum (73.3%) alcoholics are presenting with abnormal abdominal findings.
2. Among them 53% hepatomegaly,13% ascitis and 6% Spleenomegaly.

The Table 8 shows 20% of alcoholics presenting with altered sensorium than pre-coma (6.6%).

Comparison of Complete Blood Count In Moderate And Severe Alcoholics

Haemoglobin slight reduction in both moderate and severe alcoholic. Mean WBC total count is elevated. Mean RBC count is markedly reduced. P< 0.0002 * S. The Mean Corpuscular Value elevated in severe alcoholics as compare with moderate alcoholics. The Mean Corpuscular haemoglobin reduced in severe alcoholics as compare with moderate alcoholics. The Mean Corpuscular haemoglobin Concentration reduced in severe alcoholics as compare with moderate alcoholics. P<0.00004 * S.The Packed cell volume elevated in severe alcoholics as compare with moderate alcoholics. The platelet count reduced in severe alcoholics as compare with moderate alcoholics.P< 0.002 * S

Peripheral Blood Smear of Alcoholic in study group.

a.   The microcytic hypochromic anemia picture is more (28%) as compared with Macrocytic anemia presenting picture is 26% in study group
b.   Dimorphic anemia 8.88%.
c.   Thrombocytopenia 10.6%
d.   Pancytopenia 4%.

b)   The Erythroid hyperplasia Among the moderate alcoholics 6.6% and 2.6 in severe alcoholics
c)   Megaloblastic anaemia presents 13.2% in severe alcoholics as compared 4% in moderate alcoholics.

Table 6: Findings on physical examination in alcoholic study group

On Examination	Number (n=75)	Percentage
Pallor	45	60.0
Icterus	30	40.0
Clubbing	15	20.0
Pedal -edema	21	28.0
Parotid-Swelling	18	24.0
Other	19	25.33

Table 7: Per abdomen findings among study alcoholic group

P/A findings	Number (n=75)	%
Abnormal	55	73.33
Hepatomegaly	40	53.33
Splenomegaly	5	6.66
Ascitis	10	13.33

Table 8: CNS manifestations

CNSAbnormal	Number (n=75)	%
Pre Coma	5	6.66
AlteredSensorium	15	20.00

d)   Myeloidysplasia picture, 5.3% in severe alcoholics and 4% in moderate alcoholics.
e)   Sideroblastic picture more (6.6%) in severe alcoholics and 1.3% in moderate alcoholics.
f)   Vacuolated RBC are seen 5.3% in moderate alcoholics and 4% in severe alcoholics.

Comparison of LFT parameters in Moderate and Severe Alcoholic

a)   The table shows abnormal LFT 30/75 (40%). The total bilurubin raised in both moderate and severe alcoholics. P<0.000.
b)   Direct bilurubin raised more in severe alcoholics as compared with moderate alcoholics. P <0.003.
c)   The proteins levels are very low in severe alcoholics and albumin levels are very low, as compared with moderate alcoholics.
d)   SGOT & SGPT is more elevated in severe alcoholics.
e)   ALP is significantly raised in severe alcoholics. P< 0.0006 *S

DISCUSSION

The Present Study was Undertaken

1.   To describe haematological changes in alcoholics.
2.   To study the haematological changes with respect to the quantity of alcohol consumption and duration.
3.   To compare the haematological changes in moderate and severe alcoholics

Demographic Details

In our present study 75 alcoholic patients and their age group ranged from 20 years to 60 years, mean age being 45.34. In a similar study done by T. Oduola *et al.*[1] in Nigeria out of 200 patients age of patients ranged from 20 years to 57 years mean age being 36.04±11.28 years.

In our study the maximum prevalence's of alcoholics were in the age group 31-50 years (51/75) 68%. There was less prevalence of alcoholism below 20years and above 60 years. This could be probably because middle age group people belonging to lower socioeconomic status are hard working and after hard stress and want to relax in the evening by taking alcohol. The maximum number of hematological abnormalities ie anemia was seen in age group of 31 to 60 years.

In a similar study done by D. Chalmers *et al.*[2] in 1981 the mean age group was 59.9 years.

Gender Distribution

In present study among 75 alcoholics 89% (67/75) were males and 11% (8/75) were females. This shows an increasing trend of alcohol consumption in women also.

In a similar study conducted by D. Charmers *et al.*[2] in 1981 from Harrow showed a study of 219 out of which 146 (66.66%) were men 73 (33.33) were females. In a similar study conducted by Hislop *et al.*1983 in England male to female ratio of 2.9:1 was found. In a similar study done by T. Oduola *et al.*,[1] in Ile at Nigeria out of 200 (100%) all were men. In a study by Ray R ET AL 1988 from NIMHANS Bangalore all were 100% males.

Socio-economic Status
In the present study most of the patients 72% (54/75) belonged to lower socio-economic class and 28.% (21/75) were middle socio economic class. There is increased number of alcoholics in lower socioeconomic group (labor class) are visiting our hospitals. Being poor they tend to consume low quality drink like arrack. In a similar survey done by Wilson *et al.*in 1980 showed a high incidence in low socio-economic group.

Duration of Alcohol Intake
In our present study there were patients who consumed alcohol more than 10 years duration 62.6% (47/75) and 25% (19/75) were less than 10 years duration. In the similar study conducted by D. Chalmers *et al.*[2] 219/373were severe alcoholics for more than 10 years.

Another similar study conducted by T.Oduola[16] *et al.* 200 patients were studied among which 50% were moderate alcoholics consuming for less than 10 years. 50% were severe alcoholic who consumed for more than 10 years.

Presenting Complaints
In present study 60% (45/75) of patients presented with distension of abdomen. Next frequent presentation was with jaundice 40% (30/75), Bilateral pedal edema 28% (21/75), Pain abdomen 25.3% (19/75), haemetemesis 20% (15/75), malena 10.7% (8/75) breathlessness 10.7% (8/75) altered sensorium 21.3% (16/75). In a similar study done by D. Chalmers *et al.* gastrointestinal symptoms were predominant. About 60% of patients presented with duodenal ulcer and dyspepsia. 20% of patients with haemetemesis. Jaundice 20%. Altered sensorium in 10% of patients

Haematological Manifestations Complete Blood Count
In the present study the mean hemoglobin was 9.2 gms% among moderate alcoholics and 8.5gm% among severe alcoholics' In study conducted by T. Oduala *et al.* the hemoglobin (g/dl) was 14.5 ± 1.2 among moderate alcoholics and 14.8 ± 1.2 among severe alcoholics.

In our study the total count of white blood cells were mean of 10160.84±4448.65 in moderate alcoholics and 11763.9±5101.30 in severe alcoholics. In the similar study

of T. Oduola *et al.*[1] WCC (mm3) was 4 4516.7 ± 2825.6 among moderate alcoholics and 4733.3 ± 1400.6 among severe alcoholics.

In the present study MCV in moderate alcoholics was 96.6±7.77 fl. in severe alcoholics it was 104.5±11.75 The highest was 110.6fl. In the same study by T. Oduola *et al.*[1] the MCV (μm3) was 84.9 ± 9.1 in moderate alcoholics and 89.7 ± 9.7 among severe alcoholics.

In our study he MCH showed 29.00±5.32 among moderate alcoholics and 27.5±4.98 among severe alcoholics. In the similar study by T. Oduola *et al.*[1] MCH (pg/L) among moderate alcoholics was 28.4 ± 4.1 among severe alcoholics it was 28.9 ± 4.3.

In present study the MCHC was 29.8±4.37 among moderate alcoholics and 24.4±4.30

among severe alcoholics. In the same study of T. Oduola *et al.*[1] MCHC 30.8 ± 1.8 among moderate alcoholics and 32.7 ± 0.9 among severe alcoholics.

In the present study the PCV among moderate alcoholics was 27.0±7.40 and among severe alcoholics it was 28.8±4.90. In the same study conducted by T. Oduola *et al.*[1] PCV (%) 44.2 ± 3.7 among moderate alcoholics and 45.3 ± 3.8 among severe alcoholics.

Platelet count showed a mean of 190000±0.69 in moderate alcoholics, in severe alcoholics the plate let count was a mean of 140000 +_0.58. The lowest platelet count was 40,000. In the similar study by T. Oduola *et al.* the platelet count was 211733.3 ± 49906.8 among moderate alcoholics and 217966.8 ± 41736.0 among severe alcoholics. the platelet counts were above 2 lakhs normal in all groups In our study 10% of study group had thrombocytopenia out of which mean was 40,000cells/cumm. This can be the cause of transient intravascular hemolysis associated with alcoholic liver disease.[3] However haematological manifestations in T. Oduola *et al.* study showed no significant changes in occasional and moderate drinkers.

Peripheral Blood Smear
In our study moderate drinkers showed normocytic normochromic anemia in peripheral blood smear. Heavy drinkers showed 30.66% of other types anemia in the peripheral blood smear.

In the similar study by T. Oduola *et al.* in severe drinkers they showed predominantly a macrocytic blood picture in peripheral blood smear. In other similar study by Latvala Jaana and Parkkila thrombocytopenia was found in 41% of alcoholics.

In addition our study along with normocytic normochromic anemia and macrocytic anemia it also showed presence of various other types of anemia like 28% showed microcytic hypochromic, 40% normocytic normocromic anemia, 8.88% dimorphic anemia, 10.66% thrombocytopenia and 4% pancytopenia. In the similar study conducted by T. Oduola *et al.* the platelet counts were above 2 lakhs normal in all groups. In our study 10% of our study group had thrombocytopenia out of which mean was 40,000cells/cumm. In a study conducted by Latvala jaana, Parkkila 144 subjects were studied. The incidence of anemia was 51% in the alcohol abusers., (p< 0.05). A diverse pattern of hematological effects was observed in the alcohol abusers. In present study 60% of patients showed anemia among alcoholics.Increased mean cell volume of erythrocytes macrocytosis was seen in 60% of alcoholics p < 0.006. In our study 26.6% of alcoholics showed macrocytes in peripheral blood smear. In a similar study done by H. Koivisto, J. Hietala, P. Anttila[4] out of 105 alcoholics 60% showed macrocytecs in blood smear.

Bone Marrow Aspiration Study

In our study abnormalities of bone marrow shows moderate alcoholics 23 and 21 severe alcoholics. Among them Erythroid hyperplasia is seen 10.6% of moderate alcoholics and 2.6% in severe alcoholics. In addition our study 6.6% of Megaloblastic picture seen in moderate alcoholics, 9.3% in severe alcoholics. Sideroblastic picture 1.3% in moderate alcoholics and 6.6% in severe alcoholics. Vacuolation RBC 5.3% and 4% in severe alcoholics. In the similar study conducted by Latvala Jaana and Parkkila bone marrow study revealed vacuolization of pro- normoblasts in 24% of the alcoholic patients. Megakaryocytes in the cell periphery were also vacuolized in 20% of the alcohol abusers. The bone marrow abnormalities were related to the duration of alcohol intake.

In our study out of 44 patients who had abnormal bone marrow 30.6% were moderate alcoholics 28%were severe alcoholics. In a similar study done by J. Latvala., Melkko, and O. Niemelä out of 138 consecutive adult patients undergoing bone marrow aspiration due to macrocytosis 49% were severe alcoholics and 20% were moderate alcoholics. Bone marrow aspirates from 12 alcoholic patients showed vacuolization of pro-normoblasts and the presence of ring sideroblasts were noted in 8 cases. In a similar study done by Shinji Nakao, M.D.Mine Harada from japan in 1990 showed thrombocytopenia 5% in severe alcoholics.

In our present study liver function tests shows that abnormal LFT 30/75 (40%) of alcoholics. The total bilurubin raised in both moderate and severe alcoholics. P<0.000.*S Direct bilurubin raised more in severe alcoholics as compared with moderate alcoholics. P <0.003.*S The proteins levels are very low in severe alcoholics and albumin levels are very low, as compared with moderate alcoholics. SGOT & SGPT is more elevated in severe alcoholics. ALP is significantly raised in severe alcoholics. P< 0.0006 *S. In the similar study done by "Niemela O in Biomarkers in alcoholism shows the laboratory findings elevations of serum γ glutamyl transferase, alkaline phosphatase and bilirubin levels. Up to 70% of patients with moderate to severe alcoholic hepatitis already have cirrhosis identifiable on biopsy examinationat the time of diagnosis.[5] another similar study by Menon KV, Gores GJ, Shah VH of all chronic heavy drinkers, only 15–20% develop hepatitis or cirrhosis, which can occur concomitantly or in succession.[6]

Summary

1. In this study period of one years between July 2016 to July 2017, 75 adults patients were alcoholics taken for study. These patients were admitted at mahatma Gandhi Memorial Hospital Warangal.
2. Among 75 alcoholics, 49 were moderately alcoholics and 26 were severe alcoholics.
3. Among these 75 alcoholics 67 (89%) were males and 8 (11%) were females.
4. The age group of study people ranged from 20 to 60 years
5. The maximum incidence of alcoholics were in the age group 31-50 years (51/75) 68. Alcoholism was uncommon below 20 years and above 60 years.
6. 72% of patients belonged to low socio-economic group and 28% belonged to middle socio-economic group.
7. The presenting complaints included distension of abdomen in 60% (45/75) of patients. Next frequent presentation was with jaundice (30/75) 40%, Bilateral pedal edema 28% (21/75), Pain abdomen 25% (19/75), haemetemesis 20% (15/75), malena 10.6% (8/75), breathlessness 2 1% (16/75) and altered sensorium 21% (16/75).
8. On physical examination 45/75(60%) of alcoholics had pallor. Icterus was present in 30/75(40%), pedal edema was present in 21/75(28%), Clubbing was present in 15/75 20%, Parotid swelling was present in 24% (12/75), Other features of liver cell failure like loss of axillary hair, dupytrens contracture, breast atrophy and testicular atrophy were seen in 19/75 (25%) of alcoholics.
9. Per abdomen findings showed hepatomegaly was present in 40/75 (53%) of alcoholics. Spleenomegaly was present in 5/75 (6.6%), with ascitis10/75 (13%)
10. 60% of the alcoholics had anemia. The mean haemoglobin was 9.2 gms% among moderate

alcoholics and 9.0gm% among severe alcoholics.

11. The total counts of white blood cells were mean of 10160.8 ± 4448.65 cells/mm³ in moderate alcoholics and 11763.9 ± 5101.30cells/mm³ in severe alcoholics. The lowest count was 3900 cells/mm³ and the highest count was 20,700cells/mm³.

12. The mean MCV in moderate alcoholics was 96.6 ± 7.77fl. In severe alcoholics it was 104.5 ± 11.75fl, the highest was 110.6fl.

13. Platelet count showed a mean of $1.9.00\pm0.69$cells/mm³ in moderate alcoholics in severe alcoholics the platelet count was a mean of 1.40 ± 0.58. The lowest platelet count was 40,000cell/mm³.

14. Peripheral blood smear 45/75(60%) showed all types of anemia. Normocytic normchromic anemia was present in 18/45(40%) of patients. Next predominant was microcytic hypochromic anemia which was present in 12/45(28%) of patients. Macrocytic anemia was present in 11/45 (26.6%) patients. Dimorphic anemia was present in 4/45 (8.88%).

15. In the present study 31/75 (41%) showed normal bone marrow in both alcoholics. Abnormal bone marrow picture was seen in 44/75 (59%) patients. Among which megaloblastic picture was seen in 12/44 (27.4%) of alcoholics. Erythroid hyperplasia was seen in 10/75 (13%) of alcoholics. Vacuolated RBC was seen in 7/75 (9.3%). Sideroblasts was seen in 6/75 (8%) of alcoholics. 9 patient showed myelodysplastic marrow.

CONCLUSION

- Alcoholism was present in both men and women. More common among men.
- Alcoholism was common in middle aged group.
- Alcoholism predominately persisted in low socio economic group.
- Anemia is the predominant feature among chronic alcoholics. Anemia was independent of bleeding, Severity of anemia appear to be related to the severity of alcohol intake.
- There is an increased risk of cirrhosis and infection among alcoholics.

- Microcytic hypochromic, macrocytic anemia and all types of anemia can be seen in alcoholics.
- Bone marrow studies reveal predominantly megaloblastic picture. Other features seen were increased vacuolization in pro-normoblasts precursors of red blood cells, megaloblastic picture and Erythroid hyperplasia Sideroblastic and Myelodysplastic picture was also seen.
- Macrocytes was also prominent seen in peripheral blood smear.
- Thrombocytopenia was also a feature of chronic alcoholics.
- Hematological manifestations are reversible with cessation of alcohol
- Early detection of anemia among alcoholics can prevent further complications of anemia like failure and reduce the mortality in lower socioeconomic group of people.
- There also abnormality in liver function test like elevated serum bilurubin lower levels of Albumin, SGOT, SGPT and also elevated ALP in chronic alcoholics.

REFERENCES

1. Drinking patterns: biochemical and haematological findings in alcohol consumers in Ile-Ife, by Nigeria T. Oduola1*, O.G. Adesun2, T.A. Oduola3, N.R. Agbaje2 African Journal of Biotechnology Vol. 4 (11), pp. 1304-1308, November 2005 ISSN 1684–5315 © 2005 Academic Journals.

2. D M Chalmers, I Chanarin, S Macdermott, A J Levi Journal of Clinical Pathology 1980;33:3-7; doi:10.1136/jcp.33.1.3 BMJ Publishing Group Ltd & Association of Clinical Pathologists. Sex-related differences in the haematological effects of excessive alcohol consumption.

3. Aust N Z J Med. 1972 Feb;2(1):39-43. Transient intravascular haemolysis associated with alcoholic liver disease and hyperlipidaemia. Powell LW, Roeser HP, Halliday JW.

4. Koivisto, J. Hietala, P. Anttila Journal of Laboratory and Clinical Medicine. Longterm ethanol consumption and microcytosis. 2001 Volume 147, Issue 4, Pages 191-196.

5. Jump uo to: a b Niemela, O(February 2017). "Biomakers in alcoholism". Clinica chimica acta: international journal of clinical chemistry. 377 (1-2): 39-49. doj: 10.1016/j.cca.2006.08.035. PMD 17045579.

6. Jump up to: a b c d e f g h Menon KV, Gores GJ, Shah VH (October 2001). "Pathogenesis, diagnosis, and treatment of alcoholic liver disease" (PDF). Mayo Clin. Proc. 76 (10): 1021-9.doj:10.4065/76.10.1021. PMD 11605686.