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Research Article

A STUDY OF FREQUENCY AND SPECTRUM OF ABNORMALITIES IN BLOOD INDICES AND BLOOD CYTOLOGY IN PATIENTS WITH ALCOHOL DEPENDENCE SYNDROME

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ABSTRACT

Background: Alcohol consumption leads to abnormalities in various cell lines. However the association between haematological abnormalities and complications in alcohol dependence syndrome have not been established fully

Aim: To evaluate the frequency and spectrum of abnormalities in blood indices and blood cytology in patients with Alcohol dependence syndrome

Methodology: Population for study consisted of 65 consecutive patients diagnosed to have Alcohol Dependence Syndrome admitted in De-addiction ward. Patients were sub grouped based on the complications they developed during withdrawal period. Thorough clinical examination was done and relevant blood investigations were done and interpreted with the help of a clinical pathologist**.**

Results: High statistical significance of AUDIT score in diagnosis of alcohol dependence and withdrawal complications was found($p=0.001$). Majority of patients were in the age group of 31-40 years.RBC count and platelet count was found to be significantly reduced in alcohol dependence syndrome with complications($p<0.05$). Total leucocyte count variation was found to be nil significant ($p>0.05$). High prevalence of macrocytosis (15.4%), eosinophilia (15.4%), thrombocytopenia (13.8%), lymphocytosis (10.8%) were found in alcohol dependence syndrome and higher values were observed in complications.

Conclusion: Detailed evaluation of blood cytology and blood indices should be done at an early stage during management of Alcohol dependence syndrome along with AUDIT to detect patients who can develop complications.

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INTRODUCTION

Alcohol consumption results in abnormalities in various cell lines. It can cause both direct and indirect adverse effects [(1).]Alcohol use has led to the development of various disorders[(2)]. It is a serious world wide problem and cause of mortality. Alcohol abuse causes numerous alcohol related medical complications including those affecting blood and bone marrow. Alcohol causes significant mortality and morbidity and various organ systems are involved. However, evaluation on blood cytology is seldom done and alcohol abuse may have been overlooked. Nutritional deficiency, anemia, thrombocytopenia etc are caused due to the toxic effects of alcohol[(4)]. However the association between haematological abnormalities and alcohol consumption have not been established fully[(5)]. Though a number of studies have been reported from western world there is paucity of recent Indian literature on prevalence of abnormalities in blood indices and blood cytology in patients with Alcohol dependence syndrome. It is important to evaluate the effects of alcohol dependence in blood parameters and cytology and establish the usefulness of evaluation of blood indices and blood cytology in early detection of patients with potential risk of developing complications. So a study is needed to assess the effect of alcohol consumption on blood cytology so as to detect and treat hematological abnormalities early and prevent complications and mortality.

METHODOLOGY

This study was conducted in the department of psychiatry in Father Muller Medical College during the period of july 2016 to september 2016. It included 65 patients admitted in de-addiction ward and family psychiatry with diagnosis of alcohol dependence syndrome. It is a descriptive, observational study. This study has been approved by the institutional ethics committee. A structured proforma was created and a written informed consent was taken from the patients. AUDIT was used for screening the patient for pattern of alcohol use. All patients who consented for the study and those who

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satisfied the inclusion and exclusion criteria were included in the study. Inclusion criteria for the study were the patients with definite diagnosis of alcohol dependence syndrome (ICD 10-DCR) in the age group of 18-65 years and individuals who were consenting for study. Individuals (or patient bystander/relative) not consenting for the study, patients with any known blood dyscrasia or malignancy, patients receiving any cytotoxic drugs, patients less than 18 years or more than 65 years and patients taking any hematinics or multivitamins were excluded from the study. All patients were subjected to thorough clinical and mental status examination. Relevant blood investigations were sent and interpreted with the help of a clinical pathologist.

Other methods

Blood indices were analyzed using Beckman coulter model LH750 auto analyzer. Peripheral smear was manually made by push wedge method dried and stained using leishman stain.

Statistical methods

The collected data was analyzed by one way anova test, posthoc tukey test, mean, frequency, percentage and Chi-square test. One way anova test was used to analyze blood parameters and chi square test was used for categorical variables. posthoc tukey test to calculate subgroup mean.

Table 1 Sociodemographic data

	GROUPS	N	Mean	Std. Deviation	Statistic/F	P Value
Age	ADS without complication	35	40.37	10.984	0.326	0.859
	ADS with withdrawal	19	39.79	10.633		
	ADS with withdrawal and delirium	7	41.71	10.045		
	ADS with withdrawal and convulsion	2	48.5	19.092		
	ADS with withdrawal, delirium and convulsion	2	42.5	3.536		
	Total	65	40.66	10.661		

RESULTS

Sociodemographic data

The demographic profile of the patients admitted in de-addiction ward and family psychiatry ward revealed majority were in the age group between 31-40 years(n=24/65). Majority of the patient were males. Majority of subjects attending were hindus (45/65). The educational status were upto primary school (n=11/30). They almost equally hailed from rural population (n=33/65) and urban population (n=32/65). All members in the sample consumed mixed diet (65/65)

Clinical data

In this study, increased duration and amount of alcohol intake was associated with complicated withdrawal. (fig 1 and fig 2).

RBC count was found to be reduced in Alcohol dependence syndrome with complications. It was 3.91 cumm in Alcohol withdrawal state with delirium and convulsions. This was found to be having high statistical significance (p=0.002). Packed cell volume and platelet count was also found to be reduced in Alcohol dependence syndrome with complications and this was found to be statistically significant. (p=0.031). Values were significantly reduced in Alcohol dependence syndrome with delirium and convulsions than in either withdrawal delirium or convulsions. Total count variation was not found to be significant (p>0.05). Higher mean corpuscular volume and mean corpuscular hemoglobin were found in Alcohol dependence with complications.

Macrocytes were found in 15.4% of patients, elliptocytes in 6.2%, target cells in 9.2%, tear drop cells in 1.5%, anisocytosis in 13.8%, poikilocytosis in 10.8%, lymphocytosis in 10.8%, neutrophilia in 10.8%, thrombocytopenia in 13.8% and eosinophilia in 15.4% of patients in peripheral examination. Macrocytes were found to be increased in Alcohol dependence

Crosstab

			RELIGION			Total
			C	H	M	
GROUP	ADS without complication	Count	9	23	3	35
		% within GROUP	25.7%	65.7%	8.6%	100.0%
	ADS with withdrawal	Count	4	14	1	19
		% within GROUP	21.1%	73.7%	5.3%	100.0%
	ADS with withdrawal and delirium	Count	2	5	0	7
		% within GROUP	28.6%	71.4%	0.0%	100.0%
	ADS with withdrawal and convulsion	Count	0	2	0	2
		% within GROUP	0.0%	100.0%	0.0%	100.0%
	ADS with withdrawal, delirium and convulsion	Count	1	1	0	2
		% within GROUP	50.0%	50.0%	0.0%	100.0%
	Total	Count	16	45	4	65
		% within GROUP	24.6%	69.2%	6.2%	100.0%

			SEX		
			F	M	Total
GROUP	ADS without complication	Count	1	34	35
		% within GROUP	2.9%	97.1%	100.0%
	ADS with withdrawal	Count	2	17	19
		% within GROUP	10.5%	89.5%	100.0%
	ADS with withdrawal and delirium	Count	0	7	7
		% within GROUP	0.0%	100.0%	100.0%
	ADS with withdrawal and convulsion	Count	0	2	2
		% within GROUP	0.0%	100.0%	100.0%
	ADS with withdrawal, delirium and convulsion	Count	0	2	2
		% within GROUP	0.0%	100.0%	100.0%
	Total	Count	3	62	65
		% within GROUP	4.6%	95.4%	100.0%

			BACKGROUND		Total
			RURAL	URBAN	
ADS without complication	Count	15	20	35	
	% within GROUP	42.9%	57.1%	100.0%	
ADS with withdrawal	Count	11	8	19	
	% within GROUP	57.9%	42.1%	100.0%	
ADS with withdrawal and delirium	Count	3	4	7	
	% within GROUP	42.9%	57.1%	100.0%	
ADS with withdrawal and convulsion	Count	2	0	2	
	% within GROUP	100.0%	0.0%	100.0%	
ADS with withdrawal, delirium and convulsion	Count	2	0	2	
	% within GROUP	100.0%	0.0%	100.0%	
Total	Count		33	32	65
	% within GROUP		50.8%	49.2%	100.0%

			DIET MIXED	Total
GROUP	ADS without complication	Count	35	35
		% within GROUP	100.0%	100.0%
	ADS with withdrawal	Count	19	19
		% within GROUP	100.0%	100.0%
	ADS with withdrawal and delirium	Count	7	7
		% within GROUP	100.0%	100.0%
	ADS with withdrawal and convulsion	Count	2	2
		% within GROUP	100.0%	100.0%
	ADS with withdrawal, delirium and convulsion	Count	2	2
		% within GROUP	100.0%	100.0%
	Total	Count	65	65
		% within GROUP	100.0%	100.0%

With complications. Macrocytes were found in 50% of patients with alcohol dependence syndrome withdrawal state with delirium and delirium with convulsions. In alcohol withdrawal with delirium, 28.6% of patients had macrocytosis (Fig 3). Target cells were significantly associated with alcohol withdrawal complications (p=0.019)

Neutrophilia was not found in patients with withdrawal convulsions while higher occurance of thrombocytopenia was found in patients with convulsions and delirium. In this study high statistical significance was seen in association of Audit score with alcohol withdrawal complications (p=0.001)

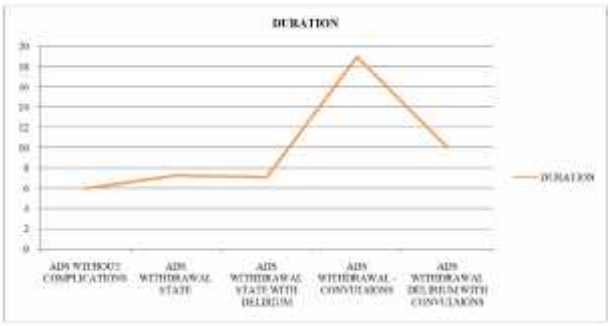

Fig 1 Depicting duration of alcohol intake and complications

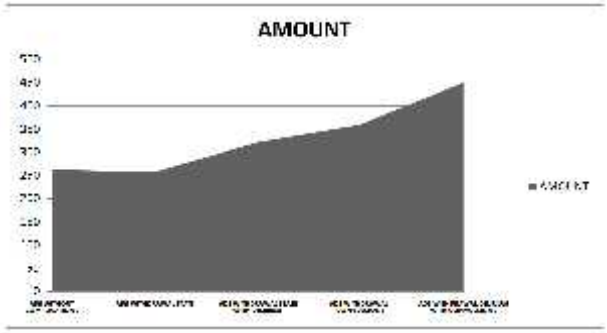

Fig 2 Depicting association of amount of alcohol intake with complications

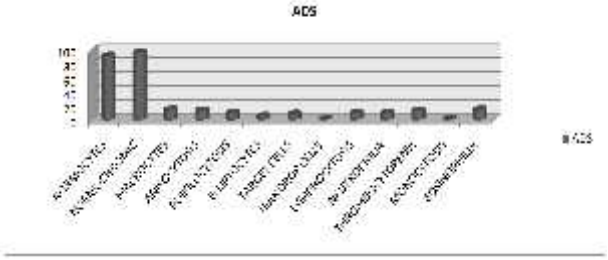

Fig 3 peripheral smear findings in ADS

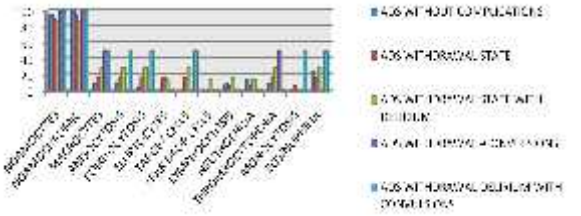

Fig 4 Peripheral smear findings in complications of Alcohol dependence

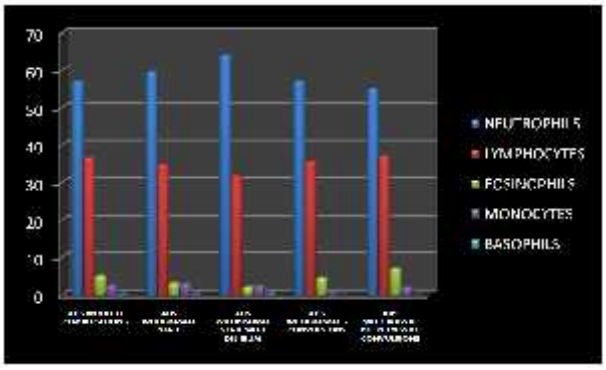

Fig 5 differential cell count in ADS-Complications

Fig 6 Audit Score Association with Complications

ADS without complication	**35**	**21.03**	**2.242**		
ADS with withdrawal	19	23.26	3.739	5.533	0.001
ADS with withdrawal and delirium	7	24.43	1.134		
ADS with withdrawal and convulsion	2	24.5	0.707		
ADS with withdrawal, delirium and convulsion	2	27	1.414		

DISCUSSION

Studies have associated alcohol use with hematological abnormalities. Alcohol also depresses the central nervous system and affects the judgement. Alcohol directly affects haemostasis by affecting modulation of plasma coagulation factors, platelet function and fibrinolysis[(3)]. One study Comparing hematological parameters in patients with non-alcoholic liver disease and alcoholic liver disease revealed that chronic alcoholism is associated with inflammation and haematological abnormalities, while non alcoholic fatty liver disease has limited effect on haematological parameters[(4)]. Another study has showed that alcohol consumption results in diverse pattern hematological abnormalities[(5)]. One study shows that major cause of macrocytosis is alcohol abuse[(7)]. Hematological abnormalities can result in various conditions like infection, hemorrhage, anemia, reduced mental capacity, depressive symptoms etc. Findings in this study were consistent with a previous study reporting that positive correlation exists between chronic alcoholism and mean corpuscular hemoglobin[(6)]. Mean corpuscular volume was also found to be higher with mean MCV of 102.35 in Alcohol dependence syndrome with delirium and convulsions. Peripheral smear findings showed higher prevalence of macrocytosis, lymphocytosis, target cells, eosinophilia and thrombocytopenia which showed a positive correlation with duration and amount of alcohol use and its complications. Heavy intake of alcohol for longer duration affects several cell lines leading to decreased immunity., anaemia, haemorrhage etc. Alcohol suppresses monocyte activation and the mechanism can be suppression of TNF-a and in our study also monocyte count was found to be low among Alcohol dependence syndrome patients. Latvala and co-workers have found that there is high occurance of macrocytes in peripheral blood picture of alcoholic patients[(5)] and this was consistent with present study. Another finding was that there is significant correlation between AUDIT score and diagnosis. So AUDIT screening can be helpful in early detection of patients who can develop withdrawal complications.

Further research into the effects of alcohol in various cell lines is needed with a large sample size to fully establish the relationship. Our study has also emphasized the need for a multimodal approach in treating patients with alcohol dependence syndrome. An effective team work often interdisciplinary is necessary for the effective management of complications in these patients.

CONCLUSION

Significant alteration of hematological indices and various abnormalities in blood cytology can be found in patients developing alcohol withdrawal complications. So detailed evaluation can be helpful in early detection of patients with potential risk of developing complications

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