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Hematological Abnormalities In Alcoholics

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Abstract:
Context*: The clinical signs of alcohol abuse are rather minimal in the early phase while most of the signs arise later after several years of excessive drinking. Among the laboratory markers hematological abnormalities, appear earlier than other biochemical abnormalities and also reversible with abstinence,Alcohol effect on hematopoeitic system are both direct & indirect, its also dose dependent, The direct consequences of excessive alcohol consumption include toxic effects on the bone marrow; suppress the production of all blood cell precursors. Alcohol's indirect effects include nutritional deficiencies that impair the production and function of various blood cells.*
Aim of the study: *The aim of our study was to investigate the alterations of hematological markers in a population of alcohol dependent individuals since the need for sensitive biological markers to detect and prove recent drinking has been the focus of many research groups. Decision making about the role of alcohol as an aetiological factor for these abnormalities in motivating patients to change their drinking habits by demonstrating the reversal of these abnormalities after abstinence.*
SettingsandDesign: *Setting: Department of Medicine, Govt Rajaji Hospital, Madurai Medical College,Madurai..*
Design Of Study*: Prospective observational study*
Period Of Study: *6 Months from November 2015 to April 2016*
Participants:*100 patients in the age group of 20-40 years with history of alcohol consumption 210 gms/week in males & 100 gms /week in females for minimum one year admitted with another primary admitting diagnosis in Department of Medicine,governmentRajaji hospital*
Method*:100 patients admitted in medical ward with another primary diagnosis are selected based on the inclusion/exclusion criteria & history is obtained from each patient based on the previously prepared proforma& clinical examination.USG abdomen & pelvis ,viral markers will be done to rule out pre existing alcoholic liver disease ,blood samples collected &sent for complete hemogram,peripheralsmear,serum B12 assay will be done in all patients to screen for pre existing B12 deficiency***.***
Results: *In the 100 patients we enquired about their drinking habits & looked for MCV,GGT,CDT,Spur cells &Pancytopenia in peripheralsmear,serum B12 levels,11% had pancytopenia & 4% had spurcells in peripheral smear which are statistically As the duration of alcohol increases the incidence of pancytopenia& presence of spur cells increases.As the duration of alcohol & quantity of consumption increasesserum B12 values decreases, as the B12 value decreases theincidence of Pancytopenia increases,hence the incidence ofPancytopenia has positive correlation both to duration & quantityof alcohol intake.There is a significant positive correlation between quantity &duration of alchol intake & rise in CDT levels.MCV rises as the duration & quantity of alcohol intake increaseswhich is independent of serum B12 levels As thequantity & duration of alcohol intake increases the serum B12 levels & Platelet count decreases*
Conclusions: *heavy alcohol consumption can cause generalized Suppression of blood cell production resulting in Pancytopenia & thrombocytopenia and the production of structurally*
abnormal blood cell precursors like spur cells that cannot mature into functional cells,apart from that there is a significant rise in CDT ,GGT levels & also there is rise in MCV both megaloblastic& non megaloblasticmacrocytosis occurs in significant percentage with the
reduction in serum B12 levels, hence these parameters could be considered as markers of alcohol abuse.
Keywords: *pancytopenia, spur cells, alcohol , serum B12*

I. Introduction

Alcohol consumption has increased considerably in the past 25 years,the need for accurate methods for detection and monitoring of alcohol related problems in different health care settings is clearly considerable.Despite such a need, there is no exact clinical finding or symptom in a patient history,that is sufficiently sensitive and specific to detect alcohol related problem in its early phase. The reasons for using biological laboratory markers are that they give objective information about alcohol consumption and changes in drinking habits. Among these laboratory markers haematological abnormalities appear earlier than

biochemical abnormalities & also reversible with abstinence. Among the hematological abnormalities, increased MCV values have been observed in 64-89% of alcohol abusers.IncreasedMCV values are also found in cases of vitamin B12 and folic acid deficiency, liver diseases, several haematological disorders,hypothyroidism,in users of anti-epileptics. Alcohol abuse has been found to explain increased MCV values in 89% of men and 56% of women in general practice .MCV return to normal after 3 months ofabstinence.

One of the recently developed routine laboratory tests for alcoholabuse is serum carbohydratedeficient transferrin (CDT). This markerconsists of the asialo, mono-sialo and di-sialo isoforms of transferrin thatare deficient in their terminal trisaccharides. CDT measurement has asensitivity of 82% and specificity of 97%. False-positives have been reported in patients with severe liver diseases (mainly in primary biliarycirrhosis, chronic hepatitis C, hepatic malignancies). Duringabstinence,the CDT values normalize with a mean half-life of 14-17days.CDT has now been shown to have a high specificity and asensitivity that is at least equal to that of the conventional laboratorymarkers. CDT values seem to increase after 10 days of drinking at level of 50-80 g ethanol per day. It also has a relatively good correlation withself-reported alcohol consumption, but not with conventional markers. These hematological abnormalities can beused as a marker of detection of alcohol abuse and for monitoring eitherabstinence or relapse during treatment."

II. Materials And Methods

Study Group: 100 patients in the age group of 20-40 years with history of alcohol consumption 210 gms/week in males & 100 gms /week in females forminimum one year admitted with another primary admitting diagnosis inDepartment of Medicine,GovernmentRajaji hospital

Inclusion criteria:

Age 20-40 yr

Alcohol consumption 210 gms of ethanol/week in males & 100gm of ethanol/week in females for minimum of one year

Exclusion criteria:

Patients with

- Liver disease
- Viral hepatitis
- Renal disease
- Known Thyroid disease
- Hematological malignancies
- h/o drug intake that alter hematological profile
- Immunosuppressed individuals
- Other comorbid illness

Ethical committee approval: obtained

Study Protocol.100 patients admitted in medical ward with another primary diagnosis are selected based on the inclusion/exclusion criteria &history is obtained from each patient based on the previously prepared proforma& clinical examination

 USG abdomen & pelvis ,viral markers will be done to rule out pre existing alcoholic liver disease ,blood samples collected &sent for complete hemogram,peripheralsmear,serum B12 assay will be done in all patients to screen for pre existing B12 deficiency

III. Statistical analysis:

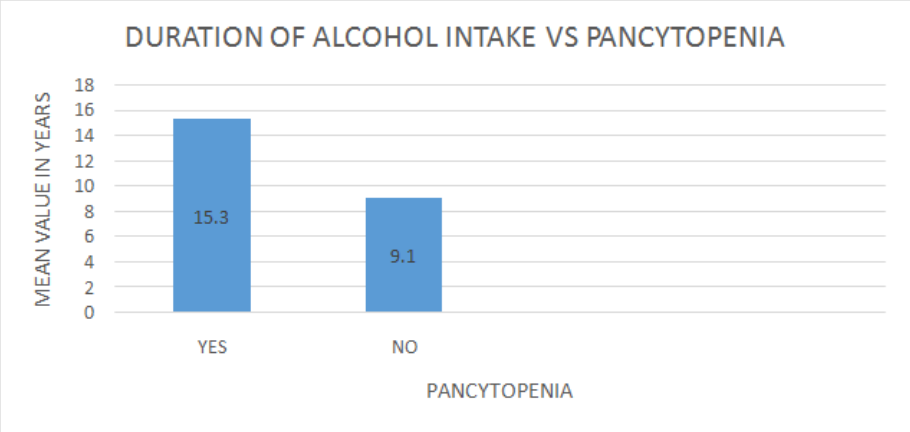
The information collected regarding all the selected cases were recorded in a master chart. Data analysis was done with the help of computer by using SPSS software and Sigma Stat 3.5 version (2012). Using this software, percentage, mean, standard deviation and 'p' value were calculated through One way ANOVA, Pearson correlation and Chi square test and P value of < 0.05 wastaken as significant.

IV. Results

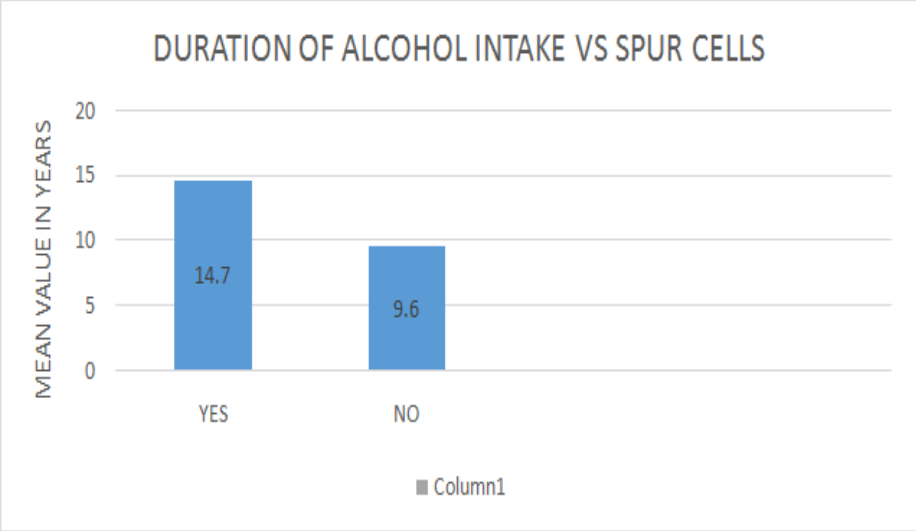
AGE GROUP (YRS)	NUMBER	PERCENTAGE
< or - 25	13	13
26-30	29	29
31-35	30	30
36-40	28	28
total	100	100

100 Patients included in the study 13% are < 25 years of age,29% are between 26-30 years,30% between 31-35 years,28& are between 36- 40 years
2. off the 100 patients 11% had pancytopenia

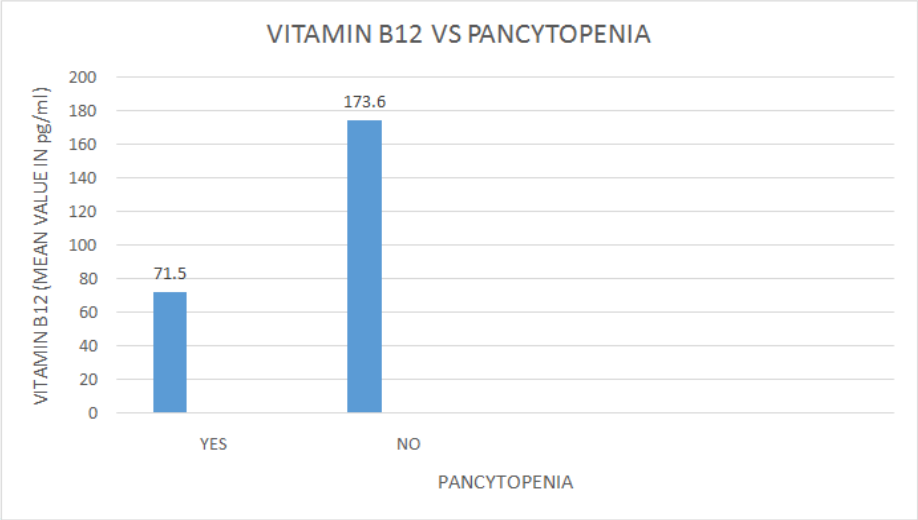
4. Duration Of Alcohol Intake Vs Pancytopenia



5.Duration Of Alcohol Intake And Spur Cells



As the duration of alcohol intake increases, the incidence of pancytopenia and the presence of spur cells increase
6.



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As the duration of alcohol & quantity of consumption increases, serum B12 values decreases, as the B12 value decreases the incidence of Pancytopenia increases,hence the incidence of Pancytopenia has positive correlation both to duration & quantity of alcohol intake

Correlation Between Alcohol Intake And Cdt

	Mean	Standard Deviation	Correlation Co Efficient	P Value
Alcohol Intake (G/Wk)	276.9	40.3		
Carbohydratedeficient Transferrin(Mg/Dl)	92.1	10.4	0.632	<0.001

8. Correlation Between Alcohol Intake And Ggt

	Mean	Standard Deviation	Correlation Co Efficient	P Value
Alcohol Intake (G/Wk)	276.9	40.3		
Gamma Glutamyl Transpeptidase (U/L)	70.7	14.2	0.726	<0.001

9.Correlation Between Alcohol Intake And Mcv

	Mean	Standard Deviation	Correlation Co Efficient	P Value
Alcohol Intake (G/Wk)	276.9	40.3		
Mcv	103	7.4	0.587	<0.001

13. Correlation Between Duration Of Alcohol Intake And Ggt

	MEAN	STANDARD DEVIATION	CORRELATION CO EFFICIENT	P VALUE
DURATION OF ALCOHOL INTAKE (In Years)	9.8	4.9		
GAMMA GLUTAMYL TRANSPEPTIDASE (U/L)	70.7	14.2	0.634	<0.001

Discussion

In our study we included 100 patients after applying inclusion &exclusion criteria,short history & clinical examination are done in all patients. all the patients were screened for serum B12 levels,MCV,Peripheralsmear,CDT,GGT values are done in all patients.In our study we included 100 patients between 20-40 years of age, incidentally all of them are males,13% are less than or equal to 25 years,29% are between 26-30 years of age,30% between 31-35 years &28 % are between 36-40 years of age.In the 100 patients we enquired about their drinking habits & looked for MCV,GGT,CDT,Spur cells &Pancytopenia in peripheralsmear,serum B12 levels,11% had pancytopenia & 4% had spurcells in peripheral smear which are statistically significant, As the duration of alcohol increases the incidence of pancytopenia & presence of spur cells increases.As the duration of alcohol & quantity

of consumption increases serum B12 values decreases, as the B12 value decreases the incidence of Pancytopenia increases,hence the incidence of Pancytopenia has positive correlation both to duration & quantity of alcoholintake.There is a significant positive correlation between quantity & duration of alchol intake & rise in CDT levels.MCV rises as the duration & quantity of alcohol intake increases which is independent of serum B12 levels.As the quantity & duration of alcohol intake increases the serum B12 levels & Platelet count decreases.

Limitations Of The Study

This study has its own limitation. The number of patients in this study is small. Hence generalizations of results of the study have to be made withcaution. The study population involved patients seeking medical care in our hospital which is a tertiary care center and hence they may not represent the general population.

V. conclusion:

Alcohol has numerous adverse effects on the various types of blood cells and their functions. For example, heavy alcohol consumption can cause generalized Suppression of blood cell production resulting in Pancytopenia & thrombocytopenia and the production of structurally abnormal blood cell precursors like spur cells that cannot mature into functional cells,apart from that there is a significant rise in CDT ,GGT levels & also there is rise in MCV both megaloblastic& non megaloblasticmacrocytosis occurs in significant percentage with the reduction in serum B12 levels, hence these parameters could be considered as markers of alcohol

abuse.Due to the limited sensitivity of any single laboratory marker, the parallel measurement of CDT with traditional alcohol markers may enhance the ability to detect alcohol abuse.studies indicate that thecombined measurement of CDT and GGT or of CDT and MCV could achieve such an enhancement

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