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CAN ALCOHOLISM CHANGE THE HAEMATOLOGICAL PARAMETERS?

Physiology

Dr Mina D Varlekar*	Assistant Professor in Physiology, M and J Institute of Ophthalmology, B J Medical college, Ahmedabad. *Corresponding Author
Dr Shilpa Menat	Senior Resident in Physiology Department, B J Medical College, Ahmedabad.
Dr Bharat Pateliya	Tutor in Pathology Department, B J Medical College, Ahmedabad.

ABSTRACT

Background: Alcoholism is a chronic and progressive disease with numerous health, social, legal, socioeconomic, mental and physical consequences seen worldwide. Multiple organs can be involved such as hepatobiliary system, cardiovascular system, central nervous system, reproductive system and hematopoietic system. Significant serious consequences on the haematopoietic system affecting blood cells, their progenitors and clotting components. **Aims and Objective:** The study is done to know hematological parameters in alcoholics as compared to non-alcoholic individuals. **Materials and Methods:** 30 subjects who take alcohol daily and 30 adult patients who are non-alcoholics were selected. Hematological parameters such as hemoglobin, red blood cell (RBC) count, total white blood cells (WBC) count, Mean corpuscular volume (MCV), and platelet (PLT) count were taken for the study. **Results:** In alcoholics Haemoglobin, RBC count, PCV and platelet count was decreased, MCV was increased. Leucocytosis and leukopenia were seen. **Conclusion:** As alcoholism has effects on haematological and haemostatic parameters in the blood, Early evaluation and management of these simple, affordable, easily available parameters may help in prevention of development of complications.

KEYWORDS

Alcoholism, Haematological Parameters, Mean Corpuscular Volume (MCV), Platelets,

INTRODUCTION

Alcoholism is defined as a chronic and progressive disease characterised by loss of control over the use of alcohol with subsequent numerous health, social, legal, socioeconomic, mental and physical consequences seen worldwide[1]. Excessive alcohol ingestion belongs to top five risk factors for preventable mortality causing 2.5 million deaths per annum that account 4 % death of all death, almost 1 in 10 deaths among young people aged 15–29 years and 69.4 million annual disability adjusted life years globally[2,3]. While low doses of alcohol have some healthful benefits, the intake of more than three standard drinks per day on a regular basis enhances the risk of cancer, vascular diseases and various systemic effects causes decrease the life span by about 10 years[4].

Alcohol consumption is known for morbidity and mortality, being a serious health hazard of the world. Multiple organs can be involved such as hepatobiliary system, cardiovascular system, central nervous system, reproductive system and hematopoietic system. Impact of alcohol on hematopoietic system divided into direct and indirect effects. Direct effect seen in bone marrow and involves red cell, white cell, and PLT lines. Indirect effect due to metabolic or physiologic alterations resulting in liver disease and nutritional abnormality such as folate deficiency lead to anaemia[5]. The medical consequences of these adverse effects can be severe and include anaemia, increased risk of bacterial infections, impaired blood clotting and fibrinolysis, leading to excessive bleeding and strokes. Abstinence can reverse many of alcohols' effect on haematopoiesis and blood cell function[5]. Many a time haematological changes are left undetected and untreated which could progress to serious complications. Early detection and treatment of haematological changes can prevent complications and reduce the mortality and morbidity.

Aims and Objectives To assess and compare the blood parameters among alcoholic and non alcoholic subjects, which would help when detected earlier in preventing serious complications due to alcoholics.

MATERIALS AND METHODS

A study conducted on patients who came to medicine department for their consultation and routine work up who brought them for treatment for alcohol use causes symptoms developed. Healthy non-alcoholic subjects who visited laboratory for routine haematological investigations were enrolled. All parameters of subjects taken and observation assessed. Total 60 subjects enrolled in study which includes 30 subjects with alcoholic and 30 subjects with non alcoholic. Age less than 18 years, taking hepatotoxic drugs, hepatic disorders are excluded from study. Basic history and Haematological parameters information of all subjects under the study was collected and compared between alcoholic and non-alcoholic subjects.

RESULTS

Maximum numbers of cases were in the age group of 31-40 years. Youngest was 20 years and oldest was 62 years. 17/30 alcoholic patients had anaemia.

Table 1: Comparison of Haematological parameters in alcoholics with non-alcoholics.

Complete blood count	Alcoholic N= 30	Non alcoholics N=30
Haemoglobin (gm)	10.05±1.06	12.25±1.28
WBC (cells/mm^3)	6734±2386	8734±1534
R B C (millions/mm^3)	3.45±0.84	4.12±0.46
M C V (fl)	92.34±9.42	87.56±8.38
P C V (%)	31.12±2.41	38.56±3.68
Platelet count (lakh)	1.55±0.42	2.75±0.86

There was decrease in the mean haemoglobin in alcoholics in comparison with non alcoholics. MCV was increased in alcoholics in comparison to non-alcoholics. The total leucocyte count was within normal limits. There was decrease in total leucocyte count in alcoholics compared to non-alcoholics. There was a decrease in RBC count, platelet count and PCV in alcoholics when compared to non-alcoholics.

DISCUSSION

The findings of this study have shown the effects of drinking patterns on haematological parameters in alcohol consumers. This study observed and highlighted several correlations between changes of some variables of complete blood count and the time of problematic alcohol consumption, which were as follows; MCV is increased whereas RBC Hb, PCV, platelets are decreased in alcoholics.

In alcoholic haemoglobin decreased compare to non alcoholic, anaemia was seen in 57% of alcoholic subjects which correlate with 50% seen in study done by Latvaala J et al[6]. Duration of alcoholintake increased shows decreased in haemoglobin level study done by Thoma E et al[7]. WBC count low in alcoholic subjects which correlate with study done by Thoma E et al[7]. Platelet count decreased in alcoholic which correlated with study done by O barbor et al[8]. Regarding MCV in alcoholic increased which correlated with study conducted by Latvaala J et al[6], Thoma E et al[7] and T Odula et al[9].

In a study by Thoma E et al, conducted on alcoholics, there was anaemia seen in alcoholics. There was significant decrease in haemoglobin, total count, haematocrit and significant increase in MCV and MCH. There was also decrease in platelet count in them [7]. Another study done in India had shown a significant reduction of hemoglobin, RBC, WBC, hematocrit, and PLT, while MCV and MCH were significantly elevated[10].

Excessive alcohol consumption can interfere with various physiological, biochemical, and metabolic processes involving the blood cells. In alcoholics' presence of abnormal RBC and decreased RBC count causes increased anaemia, variations in leukocyte count and platelet count cause increased risk of infections and excessive bleeding and strokes. A progressive rise in MCV with alcohol intake with thrombocytopenia is attributed to marrow suppression, with alcoholic abuse. The change in MCV values often predict serious alcohol- related pathology and may be a useful indicator of alcohol abuse. Alcohol adversely affects the production and function of virtually all types of blood cells. Thus, alcohol is directly toxic to the bone marrow, which contains the precursors of all blood cells, as well as to the mature cells circulating in the bloodstream. Abstinence can reverse many of alcohol's effects on haematopoiesis and blood cell functioning [5].

The present study has certain merits and limitations as low sample size, subjects who presented hospital for their symptoms were enrolled. Large sample size, multiple centres, long term follow up provides better results of same. Future studies are required to draw definite conclusions.

CONCLUSION
Excessive chronic consumption of alcohol results in profound alterations in the blood cells and their functions. Detection of hematological changes in chronic alcoholics and giving psychiatric counseling and treatment for alcohol dependence will decrease the future complications such as cirrhosis liver, cardiac and renal disease, cerebellar degeneration, neuropathy, and pancreatitis and reduce the morbidity and mortality in alcoholics.

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