



SERUM VITAMIN B12 AND FOLIC ACID LEVELS IN ALCOHOLIC LIVER DISEASE PATIENTS AT A TERTIARY CARE HOSPITAL - CORRELATION STUDY

General Medicine

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ABSTRACT

Background: Alcohol remains a significant cause of liver disease worldwide. Deficiency of folic acid is seen in alcoholic liver disease, which is multifactorial due to decreased intake, increased renal excretion, and decreased absorption of dietary folic acid. Vitamin B12 deficiency is also seen in alcoholics and its mostly functional deficiency.

Aim:

1. To measure serum vitamin B12 and serum folic acid in various stages of alcoholic liver disease.
2. To correlate between serum Vitamin B12 and serum folic acid in various stages of alcoholic liver disease.

Materials And Methods: A Hospital-based cross-sectional study was conducted in the Department of General Medicine, Santhiram Medical College and General Hospital for six months. A total of 50 number alcoholic patients who were admitted to the hospital during this period were taken into the study. **Results:** In alcoholic steatohepatitis, 50% of patients belonged to 21-30yrs and 50% in 31-40 yrs. In alcoholic cirrhosis, a majority (64.3%) belonged to 31-40 yrs. In alcoholic cirrhosis in hepatic encephalopathy majority (66.7%) belonged to 41-50yrs with a significant p-value. Higher Audit score correlated with disease severity. 8.3% of the alcoholic fatty liver had high vitamin B12, in comparison to 25%, 42.9% and 58.3% in steatohepatitis, cirrhosis and cirrhosis in hepatic encephalopathy, respectively with a significant p-value. With progressive liver disease, Vitamin B12 levels goes on increasing. 16.7% of the alcoholic fatty liver had low folic acid, compared to 33.3%, 35.7% and 50% in steatohepatitis, cirrhosis and cirrhosis in hepatic encephalopathy, respectively. **Conclusion:** Alcoholic cirrhosis in hepatic encephalopathy and alcoholic cirrhosis have higher Vitamin B12 compared to Alcoholic steatohepatitis and alcoholic fatty liver. With progressive liver disease, serum Folic acid level goes on decreasing. Rise in serum Vitamin B12 is owing to loss of Vitamin B12 into plasma with progressive liver damage and alcoholic liver disease patients actually have a functional deficiency.

KEYWORDS

INTRODUCTION:

Alcohol remains a significant cause of liver disease worldwide. Many alcoholics suffer from various degrees of both primary and secondary malnutrition. Primary malnutrition occurs when alcohol replaces other nutrients in the diet, resulting in overall reduced nutrient intake. Secondary malnutrition occurs when the drinker consumes adequate nutrients, but alcohol interferes with absorbing those nutrients from the intestine, so they are not available to the body.

Deficiency of folic acid is seen in alcoholic liver disease, which is multifactorial in character due to decreased intake, increased renal excretion, and decreased absorption of dietary folic acid. Vitamin B12 deficiency is also seen in alcoholics and its mostly functional deficiency. Alcoholics sometimes have higher than average blood levels of vitamin B12. These high levels of vitamin B12 are caused by liver damage and correlate to the severity of liver damage.

AIMS AND OBJECTIVES:

1. To measure serum vitamin B12 and serum folic acid in various stages of alcoholic liver disease.
2. To correlate between serum Vitamin B12 and serum folic acid in various stages of alcoholic liver disease

MATERIALS AND METHODS:

Type of study: Hospital-based crosssectional study.

Source of Data: Alcoholic liver disease patients in medical outpatient and admitted in medical wards of Santhiram medical college and general hospital, Nandyal.

Duration of study: From May 2021 to October 2021..

Sample Size: 50 cases.

Methods of Data Collection:

- Information will be collected through a pre-structured proforma for each study subject.
- The study will be carried out on alcoholic liver disease patients.
- Qualifying study subjects will be undergoing detailed history, clinical examination and laboratory investigations.

Sampling Technique: Simple Random Sampling.

Sampling Criteria:

Inclusion Criteria:

1. Patients more than 18 years of age.
2. Patients satisfy the AUDIT questionnaire and AASLD practical guidelines for alcoholic liver disease.
3. Patients who are willing to participate and will give informed and written consent.

Exclusion criteria:

1. Patients on drugs like methotrexate, metformin, sulfasalazine, triamterene (a diuretic), oral contraceptives.
2. Patients with celiac disease, gastro ileostomy, jejunal resection, Hemolytic anemia (increased need for folic acid), Short bowel syndrome, Ileal resection, Blind loop syndrome.
3. Alcoholic liver disease patients who are not willing to participate and will not give informed and written consent.

RESULTS:

Table 1: Age distribution of patients studied

Age in years	No. of patients	%
21-30	18	36.0
31-40	15	30.0
41-50	13	26.0
51-60	4	8.0
Total	50	100.0

Mean $\pm$ SD: 36.30 $\pm$ 9.6

Among 50 patients, the majority were 21-30(36%), and the least were in the age group of 51-60(8%).

Table 2: Gender distribution of patients studied

Gender	No. of patients	%
Female	11	22.0
Male	39	78.0
Total	50	100.0

Among patients studied, 39 (78%) were males and 11 (22%) were females.

Table 3: Audit Score distribution of patients

Audit Score	Gender		Total
	Female	Male	
<15	7(63.6%)	16(41%)	23(46%)
15-30	3(27.3%)	14(35.9%)	17(34%)
>30	1(9.1%)	9(23.1%)	10(20%)
Total	11(100%)	39(100%)	50(100%)

Among 50 patients, 23(46%) had Audit Score <15, 17(34%) had Audit Score 15-30, 10(20%) had Audit Score >30.

Table 4: Serum Vitamin B12 levels with the diagnosis of patients

Serum Vitamin B12	Diagnosis				Total
	Alcoholic fatty liver	Alcoholic Steatohepatitis	Alcoholic cirrhosis	Alcoholic cirrhosis in hepatic encephalopathy	
<187	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
187-883	11(91.7%)	9(75%)	8(57.1%)	5(41.7%)	33(66%)
>883	1(8.3%)	3(25%)	6(42.9%)	7(58.3%)	17(34%)
Total	12(100%)	12(100%)	14(100%)	12(100%)	50(100%)

P=0.055+, Significant, fisher Exact test

8.3% of the alcoholic fatty liver had high vitamin B12, compared to 25%, 42.9% and 58.3% in steatohepatitis, cirrhosis and cirrhosis in hepatic encephalopathy, respectively significant p-value.

Table 5 Serum Folic acid with the diagnosis of patients

Serum Folic Acid	Diagnosis				Total
	Alcoholic fatty liver	Alcoholic Steatohepatitis	Alcoholic cirrhosis	Alcoholic cirrhosis in hepatic encephalopathy	
<1.6	2(16.7%)	4(33.3%)	5(35.7%)	6(50%)	17(34%)
1.6-19.5	10(83.3%)	8(66.7%)	9(64.3%)	6(50%)	33(66%)
>19.5	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
Total	12(100%)	12(100%)	14(100%)	12(100%)	50(100%)

P=0.439, Not Significant, fisher Exact test

16.7% of the alcoholic fatty liver had low folic acid compared to 33.3%, 35.7%, and 50% in steatohepatitis, cirrhosis, and cirrhosis in hepatic encephalopathy, respectively.

Table 6: Comparison of clinical variables with the diagnosis of patient

Variables	Diagnosis				Total
	Alcoholic fatty liver	Alcoholic Steatohepatitis	Alcoholic cirrhosis	Alcoholic cirrhosis in hepatic encephalopathy	
Serum Vitamin B12	430.00±19.2.85	843.00±78.05	925.29±164.13	1389.33±477.39	898.04±426.31
Serum Folic Acid	6.66±2.78	3.97±2.13	2.22±1.42	1.34±0.81	3.49±2.75

p value<0.001*

DISCUSSION:

Among patients studied, 39 (78%) were males and 11 (22%) were females. All patients in Alcoholic fatty liver belonged to the age group 21-30 yrs. In alcoholic steatohepatitis, 50% of patients belonged to 21-30yrs and 50% in 31-40 yrs. In alcoholic cirrhosis, the majority (64.3%) belonged to 31-40 yrs. In alcoholic cirrhosis in hepatic encephalopathy majority (66.7%) belonged to 41-50yrs with a significant p-value. Higher Audit score correlated with disease severity. 8.3% of the alcoholic fatty liver had high vitamin B12, in comparison to 25%, 42.9% and 58.3% in steatohepatitis, cirrhosis and cirrhosis in hepatic encephalopathy, respectively with a significant p-value. Indicating with progressive liver disease Vitamin B12 goes on increasing. 16.7% of the alcoholic fatty liver had low folic acid, in comparison to 33.3%, 35.7% and 50% in steatohepatitis, cirrhosis and

cirrhosis in hepatic encephalopathy, respectively. With progressive liver disease, the folic acid level decreases in contrast with Vitamin B12.

CONCLUSION

Robust correlation between Alcoholic liver disease and Vitamin B12 and Folic acid levels are with progressive liver disease, serum Vitamin B12 level goes on increasing. Alcoholic cirrhosis in hepatic encephalopathy and alcoholic cirrhosis have higher Vitamin B12 compared to Alcoholic steatohepatitis and alcoholic fatty liver. With progressive liver disease, serum Folic acid level goes on decreasing. Alcoholic cirrhosis in hepatic encephalopathy and alcoholic cirrhosis have lower Folic acid compared to Alcoholic steatohepatitis and alcoholic fatty liver. Rise in serum Vitamin B12 is actually owing to loss of Vitamin B12 into plasma with progressive liver damage & failed activation of Vitamin B12 and alcoholic liver disease patients actually have a functional deficiency of Vitamin B12.

List Of Abbreviations:

MDF- Maddrey discriminant function

AUDIT- Alcohol Use Disorders Identification Test

MELD- Model for end-stage liver disease

MAT- Methyladenosyl transferase