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NON INVASIVE MARKER (AST/ALT RATIO) TO PREDICT FIBROSIS IN PATIENTS WITH CHRONIC LIVER DISEASE

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Abstract:

Objective: *To evaluate the AST/ALT ratio to predict fibrosis in patients with chronic liver disease at tertiary care hospital*

Patients and Methods: *Total fifty patients, of 12 to 50 years either gender had chronic liver disease by positive HCV RNA PCR and/or HBs Ag, and had liver biopsy done for evaluation purposes were enrolled and entered in this six months cross sectional study after informed consent. The brief history was taken and relevant clinical examination was performed while the laboratory investigations includes liver function test, serum albumin, ultrasound abdomen, prothrombin time (PT), international normalized ratio (INR), and partial thromboplastin time (APTT). The AST / ALT ratio was calculated and ≥1 was considered as significant fibrosis while the data was saved on pre-designed proforma. The SPSS 16 was used to analyze the data and to manipulate the mean ±SD, frequencies and percentages.*

Results: *During six months study period total fifty patients with chronic liver disease were evaluate for cirrhosis and fibrosis by serum indirect markers. The mean ± for age (years) & duration of chronic liver disease (years) for whole population was 42.63±6.55 & 6.62±2.74 respectively. The AST/ALT ratio (≥1) was detected in 32 (64%) patients with chronic liver disease (CLD).*

Conclusion: *AST/ALT ratio is non-invasive with no risk of complications, eliminates sampling and observer variability, may allow dynamic calibration of fibrosis and can be performed repeatedly to evaluate the severity of liver disease.*

Keywords: *AST/ALT ratio, chronic liver disease and Non invasive marker*

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INTRODUCTION:

Chronic liver diseases (CLD) due to chronic viral infections are common cause for mortality and morbidity [1, 2]. The disease leads to fibrosis and cirrhosis with associated complications [3], despite of advance therapeutic options to manage CLD, exact evaluation of fibrosis has become important; to plan for management strategy, evaluate prognosis & assess disease severity as far as CLD is concerned [4]. Chronic liver disease (CLD) due to viral origin is leading cause of hepatoma worldwide [5]. The increasing prevalence of chronic liver disease (CLD) is problematic and further rising its number in subsequent years [5, 6]. Liver fibrosis is the final pathway and immune, viral, toxin induced liver injuries all results in extracellular matrix expansion, fibrous tissue accumulation, hepatic architecture distortion and leads to liver cirrhosis [7, 8] The alternative to liver biopsy are serum non invasive markers of hepatic fibrosis as they are cost effective, less invasive and can evaluate the dynamic and severity of significant fibrosis [9, 10]. Therefore it is important for both patients and clinicians to acquire exact information about the severity of hepatic fibrosis to monitor disease activity and plan for early management strategies as far as chronic liver disease / liver cirrhosis is concerned in our population visited at teaching hospital.

PATIENTS AND METHODS:

Total fifty patients, of 12 to 50 years either gender had chronic liver disease by positive HCV RNA PCR and/or HBsAg, and had liver biopsy done for evaluation purposes were enrolled and entered in this six months cross sectional study after informed consent at tertiary care teaching hospital. The individuals had increased ALT for more than six months, whose PCR remained positive after antiviral therapy were also enrolled, provided had liver biopsy performed within the last six months. The exclusion criteria of the study were the patients with chronic liver disease other than viral origin, decompensated cirrhosis (Child-Pugh class C), already on antiviral therapy and PCR negative after treatment and the patients with insufficient liver biopsy specimen. The brief history was taken and relevant clinical examination was performed while the laboratory investigations includes liver function test, serum albumin, ultrasound abdomen, prothrombin time (PT), international normalized ratio (INR), and partial thromboplastin time (APTT). The AST / ALT ratio was calculated while the data was saved on pre-designed proforma. The SPSS 16 was used to analyze the data and to manipulate the mean ±SD, frequencies and percentages.

RESULTS:

During six months study period total fifty patients with chronic liver disease were evaluate for cirrhosis and fibrosis by serum indirect markers. The mean ± for age (years) & duration of chronic liver disease (years) for whole population was 42.63±6.55 & 6.62±2.74 respectively. The demographical and clinical profile of study population is presented in Table 1.

TABLE 01: THE DEMOGRAPHICAL AND CLINICAL PROFILE OF THE PATIENTS

AGE (years)	**FREQUENCY (N=50)**	**PERCENTAGE (%)**
12-19	09	18
20-29	12	24
30-39	15	30
40-50	14	28
GENDER		
Male	30	60
Female	20	40
RESIDENCE		
Urban	18	36
Rural	32	64
Duration of CLD (years)		
<1	08	16
1-3	12	24
3-5	16	32
≥5	14	28
Etiology of CLD		
Hepatitis B	13	26
Hepatitis C	34	68
Hepatitis B and C	03	06
AST/ALT Ratio (≥1)		
Yes	32	64
No	18	36
Cirrhosis /Fibrosis		
Yes	32	64
No	18	36

DISCUSSION:

Afdhal NH, et al [11] and Park GJ, et al [12] reported AST/ALT ratio ≥1 in thirty patients with liver cirrhosis with positive predictive value and specificity as 74% and 96%. Although it has been previous known that the AST/ALT ≥1 is not diagnostic in relation to chronic liver disease due to chronic viral hepatitis is concerned [12]. In former study, the individuals had chronic liver disease shown positive association between degree of liver fibrosis and chronic viral hepatitis [13]. The AST/ALT ratio ≥1 can be suggestive of liver cirrhosis and specificity and sensitivity 98% and 79% diagnostically [13]. The combination of AST/ALT along with platelet count of < 130 x 10^9/l improve the diagnostic accuracy with negative predictive value as 86% and positive predictive value as 97% respectively [14]. Furthermore, AST/ALT ration reported to be directly proportional to chronic liver disease progression assessed by MELD and Child Pugh scores [11]. The relative increase in AST is probably related to either decrease clearance of AST by liver sinusoidal cells or mitochondrial dysfunction or both or ratio of >1.0 is suggestive of this diagnosis of liver cirrhosis [15-17]. The importance of AST/ALT ratio is not universal and gender to all hepatic disorders especially autoimmune disorders and alcohol liver disease [18]. In addition to diagnosing hepatic fibrosis, the test important in predicting alterations in severity of fibrosis over time in subjects with CLD. Those patients who favorably respond to therapy have changes in mean serum values of fibrosis markers. Thus, the non invasive tool may be useful to estimate the early significant fibrosis and also evaluates the treatment response in relation to histological and clinical improvement.

CONCLUSION:

The AST/ALT ratio most widely used alternative to liver biopsy to stage chronic liver disease. It is non-invasive, cost effective, may allow dynamic calibration of fibrosis and can be performed repeatedly to evaluate the severity of liver disease.

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