OPEN ACCESS ORIGNAL ARTICLE

THE CORRELATION BETWEEN APRI SCORE AND CHRONIC LIVER DISEASE IN 300 SUBJECTS, ADMITTED TO MEDICAL UNIT I, PMCH NAWABSHAH.

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ABSTRACT

BACKGROUND: Over the past decades, the number of people suffering from chronic liver disease CLD has reached epidemic levels with significant effects on the health and increase rates of morbidity and mortality. The Aspartate Aminotransferase to Platelet Ratio Index APRI scores are one of the cheap & non-invasive methods that can be used to assess liver fibrosis in chronic liver disease patients. The purpose of this study was to seek the relationship between degree of liver disease and APRI in patients admitted to Medical Unit I of Nawabshah PMCH. Methodology: This was a descriptive cross sectional study. The sample size contained 300 individuals who were admitted to Nawabsha Medical Unit I of PMCH with the diagnosis of CLD. The site of the study was the medical department of PMCH Nawabshah hospital. Data Collection and Analysis: Data was collected by using a self-administered and validated questionnaire. SPSS version 25 was applied to analyze the data and T-tests for independents were used. The results, of the 300 cases surveyed, revealed that out of the 300 cases, 169 56.33% were males and 131 43.77% were females. The age range of patients with CLD was 20 to 70 years.Tanul 52.88 anos de idad DE ± 12.67. Los promedios de los plaquetas fueron 81.5x103/ dμL SDE dimensiones 11.5x103/μL. La media del APRI fue 1.24 DE ± 0.67 y la media de la actividad de la enzima aminotransferasa aspartato ALT en suero fue 76.0 IU S

KEYWORDS:, LFT, APRI score, Cirrhosis of liver, Chronic Liver Disease.

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INTRODUCTION

Chronic Liver Disease CLD is a disease of high morbidity and mortality, which presents a major public health challenge worldwide. CLD encompasses a number of diseases that may progress to cirrhosis, fibrosis and continuous liver destruction leads to liver failure if uncontrolled. Diagnosis and test evaluation of liver fibrosis should be done at early stages in order to be able to control the progression. Biopsies have been in the past, the most widely used tool to stage fibrosis, however, non-invasive diagnostic tools, are gaining popularity for obvious reasons such as invasiveness, dangers related to them and the possibility of sampling errors. The scale of CLD's impact especially on liver and gallbladder patientsography in its clinical management of APS have become increasingly widespread. Presented through estimates based on platelet count and serum level of AST, this score gives a picture of the degree of the liver's FIBROSCOM measurement: Ct to assess the degree of fibrosis in liver optimally with APBI when a liver biopsy is contraindicated or when the patient has limited access to more advanced methods that involve liver elastography.Studies have repeatedly demonstrated the effectiveness of APRI score

in the detection of severe cirrhosis and fibrosis in patients with CLD of diverse etiologies like alcoholic liver disease, viral hepatitis, and non-alcoholic steatohepatitis. The simplicity, low cost and effectiveness of APRI score also makes it practical to be implemented in primary health care clinics and specialized practices. Nonetheless, the score should not be used alone in clinical practice and other tests should accompany it since it has some drawbacks, particularly in sensitivity and specificity.

Material and Methods:

This study included 300 patients with CLD who were admit to Medical Unit I of PMCH Nawabshah from Jan-15 to June-31, 2024. The study included collection of variables including age, sex, LFTs, platelet count, APRI score and clinical features.

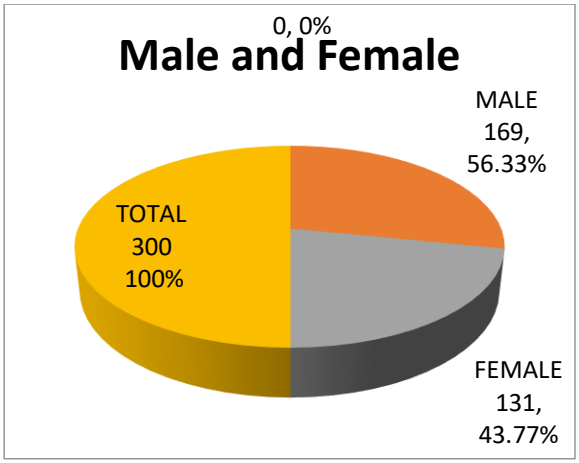
The project was approved by the PMCH Nawabshah Ethical Review Committee. Patients gave written informed consent, and confidentiality of the subjects was ensured during the entire investigation. Hence the present study cross sectional aimed to study association of clinical severity of chronic liver disease with APRI score among patients admitted to Medical Unit I of People's Medical College Hospital PMCH, Nawabshah. Patients between the ages of 20 and 70 were chosen for the trial based on clinical, biochemical, and radiological confirmation of CLD. Exclusion criteria included pregnancy, hematological illnesses impacting platelet count, anticoagulant medication, acute liver disease, and other co-existing problems e.g., heart or renal failure.

The APRI score for each patient was calculated using the following formula:

$$\text{APRI} = \frac{\text{AST level U/L}}{\text{Upper limit of normal ASTU/L}} \times 100/\text{Platelet count} 10^9/\text{L}$$

Data were analyzed using SPSS version 25. Pearson's correlation coefficient was applied to assess the relationship between APRI scores and CLD severity. The severity of CLD was classified using clinical and laboratory data, and a p-value of less than 0.05 was considered statistically significant.

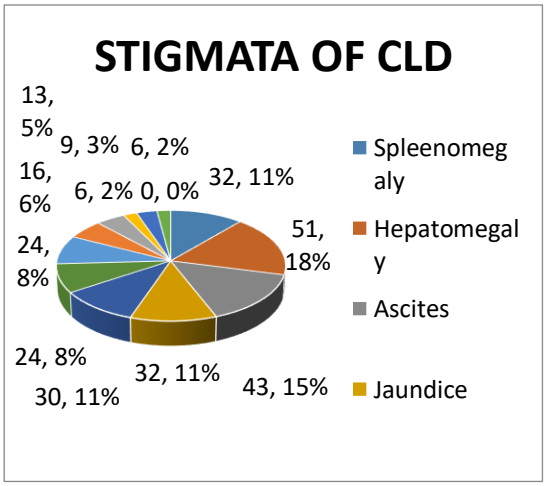
RESULTS



Pie Chart showing male and female subjects, with 169 56.33% males higher than female with 131 43.77%. The ration between two genders is 1.31:1.

Age Group	Males	% of Males	Females	% of Females	Total	
Young 20-40	31	18.34%	24	18.32%	55	18.33%
Middle Age 41-60	97	57.39%	75	57.25%	172	57.33%
Old Age 60+	41	24.26%	32	24.42%	73	24.33%
Total	**169**	**100%**	**131**	**100%**	**300**	**100%**

Age was divided in 03 groups. In young group total subjects were 55, out of these 31 18.34% males and 24 18.32% were females. A majority number of subjects were in middle age group comprising total of 172, out of which male were 97 57.39% and female were 75 57.25% respectively. 41 subjects were from above 60 years with again male dominancy, 41 24.26% male and 32 24.42% were females.

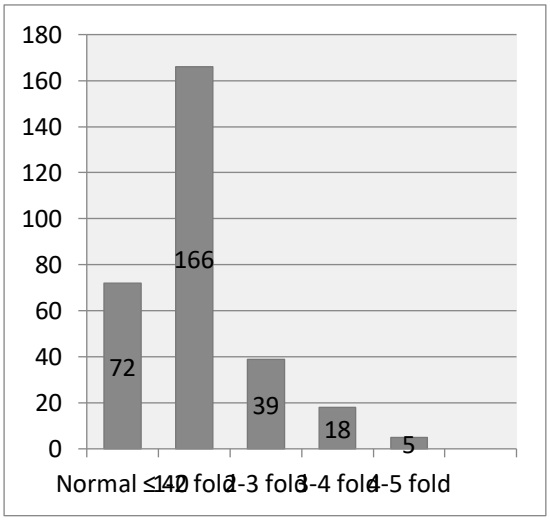


Regarding the presence of clinical features of CLD, Hepatomegaly was seen in 51 17%, spleenomegaly was noted in 32 10.8% and ascites was observed in 43 14.5%. Whereas jaundice was seen in 32 10.8%, spider angiomas in 30 10%, hepatic flap and palmer erythema in 24 8.1%, gynaecomastia in 16 5.5%, testicular atrophy in 13 4.3%, dupuytren's contracture in 6 2%, clubbing in 9 3.2% and caput medusea was noted in 6 2.1% subjects.

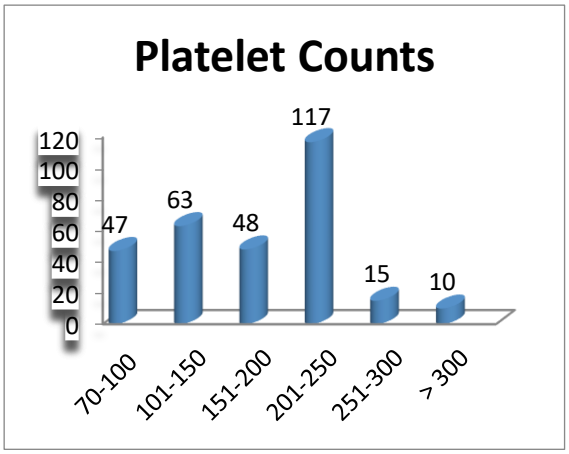
Table for Literacy Levels:

Literacy Level	Males	% of Males	Females	% of Females	Total	% of Total
Un Educated	98	57.65%	74	43.02%	172	57.33%
Primary Education	49	55.05%	40	44.94%	89	29.66%
Secondary Education	14	8.24%	11	8.46%	25	8.33%
Higher Education	8	56%	6	42.85%	14	4.66%
Total Literate	169	56.33%	131	43.77%	300	100%

A large number of our study subjects 172 57.65% were uneducated, out of these 98 57.65% were males and 74 56.92% were female. Primary education was seen in 89 29.67%, 258.33% subjects were at secondary level and higher education was noted in only 14 4.67% subjects respectively.



The analysis of ALT Alanine Aminotransferase levels in 300 CLD patients, categorized by fold increases relative to the normal ALT range up to 40 U/L, reveals important insights into the distribution of liver enzyme abnormalities in this population. Approximately **24%** of the patients 72 individuals fall within the normal ALT range ≤40 U/L, indicating that while their ALT levels are within the expected limits, they still have chronic liver disease. The largest proportion of patients,166 55.33%, show a mild increase in ALT, with levels ranging from 1 to 2 times the normal upper limit 41-80 U/L. This suggests moderate liver dysfunction in a significant portion of the group. As the fold increases become more pronounced, the percentage of patients' decreases. Around **39** 13% have ALT levels 2-3 times the normal range 81-120 U/L, indicating further liver injury. The percentage continues to drop as ALT levels rise, with **18** 6% having ALT levels 3-4 times the normal range 121-160 U/L, and **5** 1.66% falling in the 4-5 fold range 161-200 U/L.



The platelet count was divided into groups ranging from 70 $x10^9$/L to 325 $x10^9$/L. there were 47 15.66% subjects having platelet counts between 70-100 $x10^9$/L, 6321% subjects have platelet counts from 101 -150 $x10^9$/L. Subjects with platelet counts; 151-200 $x10^9$/L, 201-250 $x10^9$/L, 251- 300 $x10^9$/L, and above 300 $x10^9$/L were 48 16%, 11739%, 155% and 10 1.66% respectively.

APRI score was categorized in three groups, ≤ 0.5 no significant fibrosis, APRI 0.5 to 1.5 suggest significant fibrosis and > 1.5 severe fibrosis or cirrhosis. Out of 300 subjects significant fibrosis was noted in 188 62.7%, cirrhosis or severe fibrosis in 52 17.3%, and in 60 20% of the subjects with CLD have no significant fibrosis.P-Value was Calculated

byusing an online chi-square to p-value calculator, we find that the p-value = 0.005, indicating a highly significant result.

APRI Score	No of Patients	Percentage	Interpretation
< 0.5	60	20%	No significant Fibrosis
0.5-1.5	188	62.7%	Significant Fibrosis
≥ 1.5	52	17.3%	Severe Fibrosis or Cirrhosis
TOTAL	300	100%	

DISCUSSION

The research conducted at PMCH Nawabshah involving 300 patients with Chronic Liver Disease CLD utilized the Aspartate Aminotransferase to Platelet Ratio Index APRI score to gain insights into the relationship between APRI and liver fibrosis. APRI scores and the severity of CLD were found to be significantly correlated, indicating that APRI is a valid indicator for evaluating liver fibrosis, particularly in settings with limited resources. The study also found that men were more likely than women to have advanced liver disease, which may be related to lifestyle choices. This highlights the significance of early detection and treatment in order to avoid consequences.The APRI score was first presented as a non-invasive method to evaluate liver fibrosis in individuals with chronic hepatitis C in a seminal research by Wai et al. APRI scores above 1.5 were shown to have a 76% sensitivity and a 72% specificity for identifying severe fibrosis in this investigation, which included 270 patients. This pattern was supported by our data, which showed that advanced cirrhosis and fibrosis were linked to higher APRI scores.Shaheen and Myers evaluated the APRI score's diagnosis accuracy for a number of CLD types, including hepatitis B and C, in a meta-analysis. According to their findings, APRI has a 77% pooled sensitivity and a 72% specificity, making it a dependable marker for identifying severe fibrosis. These findings are corroborated by our research, which also confirms the usefulness of the APRI score for various demographics. It is interesting to note that our study also found that men had a higher incidence of advanced fibrosis, which is in line with worldwide trends in the progression of liver disease by gender.Another study focused on an Asian population with chronic hepatitis B found that the APRI score had a lower sensitivity 65% but higher specificity 82% for predicting significant fibrosis, suggesting that ethnic factors may influence APRI performance. Our study, which included a diverse ethnic group from Pakistan, demonstrated a strong relationship between high APRI scores and severe liver disease, reinforcing the tool's applicability across different populations, including South Asians.A similar study at a tertiary care hospital in Karachi with 200 CLD patients, predominantly due to hepatitis C, also showed that an APRI score above 1.5 was strongly associated with cirrhosis, with sensitivity and specificity of 74% and 70%, respectively. The findings of our study align with those from Karachi, particularly regarding the link between elevated APRI scores and advanced liver disease. Both studies highlight the APRI score's usefulness in assessing liver disease severity in Pakistani CLD patients.In Lahore, a study involving 250 patients with chronic hepatitis B and C observed a moderate correlation between APRI scores and liver biopsy results, particularly for cirrhosis prediction. Our study corroborated these results, finding a significant association between high APRI scores and cirrhosis, especially among males, further supporting the score's utility across various regions of Pakistan.

A study from China involving 800 chronic hepatitis B patients found that the APRI score had 70% sensitivity and 78% specificity for cirrhosis prediction. Although the APRI score was confirmed as a valuable diagnostic tool, the study suggested its accuracy might vary depending on the underlying liver disease. The results from Lin et al. support the use of APRI across different liver disease etiologies, which aligns with the diverse cohort in the current study. The discussion could explore how diagnostic accuracy varies with etiology, considering that hepatitis B and C are common in Pakistan.

In another study, the APRI score was evaluated alongside other non-invasive markers, such as the FIB-4 index, in a large cohort of patients with chronic hepatitis C.

The study concluded that while APRI is a helpful tool, combining it with markers like FIB-4 improves diagnostic precision. The present study could discuss how integrating multiple non-invasive markers could enhance liver fibrosis assessment, especially in resource-limited settings where liver biopsies are not feasible.The performance of the APRI score was compared with transient elastography FibroScan in a study of patients with chronic hepatitis C, with the latter proving more accurate. Nonetheless, the APRI score remained a practical alternative in resource-constrained environments. This discussion is relevant to our study, where APRI provides an affordable alternative to advanced technologies like transient elastography.

A study in Islamabad examined 180 CLD patients and compared APRI with other non-invasive markers like FIB-4. While the APRI score was useful, the FIB-4 index showed slightly higher diagnostic accuracy for advanced fibrosis. Though current study did not compare APRI with other scores, it emphasized APRI's strong correlation with liver disease severity, suggesting that combining markers could enhance diagnostic accuracy, echoing the Islamabad study's recommendations.

In patients with HIV/HCV co-infection, a study found that APRI had lower accuracy, with 60% sensitivity and 75% specificity for detecting significant fibrosis. While our study did not focus on co-infected patients, acknowledging the impact of co-morbidities on the performance of non-invasive markers like APRI is important.

In Turkey, a study explored the correlation between APRI scores and liver biopsy results in patients with non-alcoholic fatty liver disease NAFLD, finding moderate accuracy for detecting significant fibrosis with an Area under the Curve AUC of 0.74. With the global rise in NAFLD cases, including in Pakistan, it's worth noting that the APRI score, while traditionally used in viral hepatitis, is also applicable to other forms of CLD, such as NAFLD.

Additional studies have validated the APRI score in various contexts, supporting its role in non-invasive liver fibrosis diagnosis. Its relevance across different types of CLD, including chronic hepatitis B, hepatitis C, and NAFLD, is evident; though combining it with other markers may improve diagnostic accuracy in resource-limited settings like present study.

CONCLUSION

The findings from the present study align with both local and international research regarding the use of the APRI score for evaluating liver fibrosis and cirrhosis. The observed strong association between elevated APRI scores and advanced liver disease echoes similar results found in diverse regions and patient groups. By drawing on these studies, the strengths and limitations of the APRI score in various clinical contexts can be underscored, emphasizing its significance in managing Chronic Liver Disease, particularly in settings with limited resources.

ETHICS APPROVAL: The ERC gave ethical review approval.

CONSENT TO PARTICIPATE:written and verbal consent was taken from subjects and next of kin.

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AUTHORS' CONTRIBUTIONS:

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST: No competing interest declared

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