

Original Research Article

SERUM PROLACTIN AS A BIOMARKER OF CIRRHOSIS SEVERITY: CORRELATION WITH CHILD-PUGH SCORE IN A TERTIARY CARE HOSPITAL IN SOUTH GUJARAT

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Received : 27/08/2026
Received in revised form : 22/09/2026
Accepted : 05/10/2026

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DOI: 10.70034/ijmedph.2026.4.74

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (4); 502-504

ABSTRACT

Background: Serum prolactin may serve as a potential biomarker for assessing the severity of liver cirrhosis. This study evaluated its correlation with the Child–Pugh score. **Materials and Methods:** A hospital-based observational study was conducted on 79 patients with liver cirrhosis over 12 months. Serum prolactin levels were measured and correlated with Child–Pugh classification. **Results:** Serum prolactin showed a significant positive correlation with Child–Pugh score ($r = 0.544$, $p < 0.001$). ROC analysis demonstrated an AUC of 0.818, with 92.6% sensitivity and 61.5% specificity at a cut-off of ≥ 1029 mIU/mL for identifying Child–Pugh Class C cirrhosis. **Conclusion:** Serum prolactin is significantly associated with cirrhosis severity and may serve as an adjunctive biomarker for identifying advanced liver disease.

Keywords: Serum prolactin, Liver cirrhosis, Child–Pugh score, Biomarker.

INTRODUCTION

Cirrhosis is a progressive chronic liver disease characterized by hepatic architectural distortion, portal hypertension, impaired synthetic function, and multiple systemic complications. Accurate assessment of disease severity is essential for clinical decision-making and prognostication.^[1,2] The Child–Pugh score remains one of the commonly used tools for assessment of severity of cirrhosis, although it incorporates subjective clinical parameters such as ascites and hepatic encephalopathy.^[3] Serum prolactin levels may be altered in chronic liver disease because of disturbed hepatic metabolism of hormones and disturbances in the hypothalamic–pituitary axis.^[4] Previous studies have suggested an association between elevated serum prolactin and increasing severity of cirrhosis. However, evidence remains heterogeneous, particularly regarding its ability to discriminate severe disease.^[5] The present study was undertaken to evaluate the relationship

between serum prolactin levels and cirrhosis severity as determined by the Child–Pugh score and to assess its diagnostic performance in identifying patients with severe cirrhosis.^[6,7]

Aim and Objectives

To evaluate the correlation between serum prolactin levels and Child–Pugh score in patients with liver cirrhosis and to determine the diagnostic performance of serum prolactin for identifying patients with Child–Pugh Class C cirrhosis.

MATERIALS AND METHODS

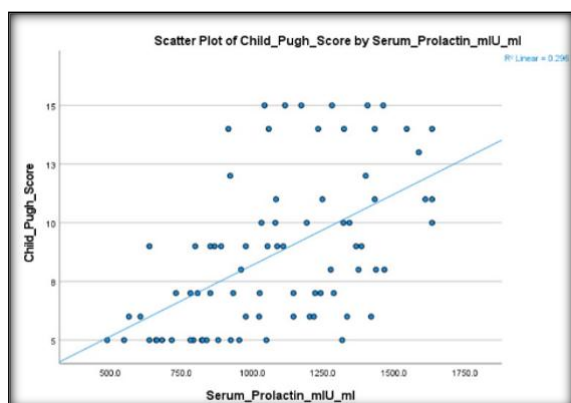
A hospital-based cross-sectional observational study was conducted over a period of 12 months in a tertiary care hospital in South Gujarat. A total of 79 adult patients with clinically or radiologically established liver cirrhosis were included using consecutive sampling. Patients receiving medications known to influence prolactin levels and those with conditions that could significantly alter serum

prolactin, including overt hypothyroidism, advanced chronic kidney disease, pituitary adenoma, pregnancy or lactation, active malignancy, acute-on-chronic liver failure, recent gastrointestinal bleeding, and other predefined exclusion criteria, were excluded.

Serum prolactin was measured from a morning fasting blood sample after an appropriate period of rest before venepuncture. Cirrhosis severity was assessed using the Child–Pugh scoring system, based on serum bilirubin, serum albumin, prothrombin time/INR, ascites, and hepatic encephalopathy. The relationship between serum prolactin and Child–Pugh score was assessed using correlation analysis. Differences in prolactin levels across Child–Pugh classes were evaluated statistically, and receiver operating characteristic (ROC) analysis was performed to determine the ability of serum prolactin to identify Child–Pugh Class C cirrhosis.

RESULTS

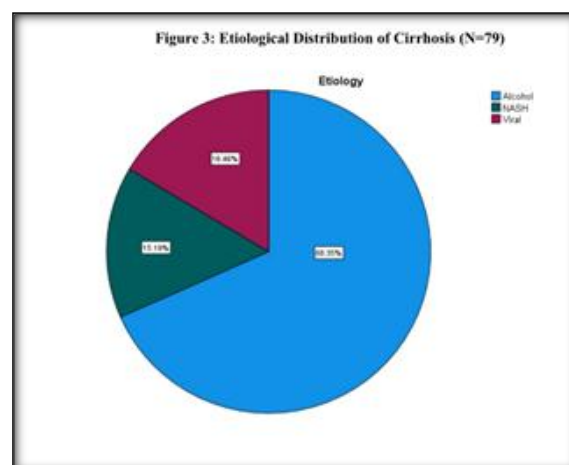
Parameter	Value
Total Sample Size	79
Severe Cirrhosis (Class C)	27
Mild–Moderate (Class A+B)	52
Area Under Curve (AUC)	0.818
Standard Error	0.046
95% Confidence Interval	0.728 – 0.909
p-value	<0.001
Optimal Cut-off	≥1029 mIU/mL
Sensitivity	92.6%
Specificity	61.5%



Among the 79 patients, 66 (83.5%) were males and 13 (16.5%) were females. The majority of patients

belonged to the 30–50-year age group (51.9%), followed by those aged 51–70 years (48.1%). Alcohol-related cirrhosis was the predominant etiology (68.4%), followed by viral hepatitis (16.5%) and metabolic dysfunction-associated steatohepatitis (MASH) (15.2%). According to Child–Pugh classification, 26 (32.9%) patients were Class A, 26 (32.9%) were Class B, and 27 (34.2%) were Class C. Serum prolactin demonstrated a progressive increase with worsening Child–Pugh class. The mean serum prolactin level was 887.55 ± 262.10 mIU/mL in Class A, 1059.99 ± 240.82 mIU/mL in Class B, and 1300.82 ± 223.90 mIU/mL in Class C. The difference in mean prolactin levels across the three Child–Pugh classes was statistically significant ($F = 19.444$, $p < 0.001$). A statistically significant moderate positive correlation was observed between serum prolactin and Child–Pugh score ($r = 0.544$, $p < 0.001$), indicating that higher prolactin concentrations were associated with greater severity of hepatic dysfunction.

ROC analysis demonstrated good discriminatory ability of serum prolactin for identifying Child–Pugh Class C cirrhosis, with an area under the curve of 0.818 (95% CI: 0.728–0.909; $p < 0.001$). At a cutoff value of ≥ 1029 mIU/mL, serum prolactin demonstrated a sensitivity of 92.6% and specificity of 61.5% for identifying severe cirrhosis.



DISCUSSION

Summary:

The study included a total of 79 patients diagnosed with liver cirrhosis.

* Age distribution showed that 51.9% of patients were between 30–50 years, while 48.1% were between 51–70 years, indicating early-to-middle age predominance.

* Gender distribution revealed marked male dominance, with 83.5% males and 16.5% females.

* Etiology of cirrhosis was predominantly alcohol-related in 68.4% of cases, followed by viral hepatitis (16.5%) and MASH (15.2%).

* Ascites severity distribution showed moderate ascites in 43.0%, severe ascites in 31.6%, mild ascites

in 12.7%, and no ascites in 12.7%, indicating that the majority presented in a decompensated state.

* Hepatic encephalopathy (HE) was absent in 50.6%, while Grade 1 HE was observed in 30.4% and Grade 2 HE in 19.0% of patients.

* Child–Pugh class distribution demonstrated near-equal representation: Class A – 32.9%, Class B – 32.9%, and Class C – 34.2%, ensuring balanced severity stratification.

* Esophageal varices were present in 12.7% of patients, while 87.3% had no documented varices.

* Spontaneous bacterial peritonitis (SBP) was observed in 6.3% of cases, whereas 93.7% did not have SBP.

* A statistically significant moderate positive correlation was observed between Child–Pugh score and serum prolactin levels ($r = 0.544$, $p < 0.001$).

* Mean serum prolactin levels increased progressively across Child–Pugh classes, from 887.55 ± 262.10 mIU/mL in Class A, to 1059.99 ± 240.82 mIU/mL in Class B, and 1300.82 ± 223.90 mIU/mL in Class C, with high statistical significance ($F(2,76) = 19.444$, $p < 0.001$).

* No statistically significant association was observed between prolactin levels and ascites severity ($F(3,75) = 0.812$, $p = 0.491$).

* No statistically significant association was observed between prolactin levels and hepatic encephalopathy grade ($F(2,76) = 0.585$, $p = 0.559$).

* A statistically significant difference in prolactin levels was observed according to presence of varices ($p = 0.048$), though the magnitude was modest.

* ROC analysis for predicting severe cirrhosis (Child–Pugh Class C) showed an Area Under Curve (AUC) of 0.818 (95% CI: 0.728–0.909, $p < 0.001$).

* An optimal cut-off value ≥ 1029 mIU/mL demonstrated high sensitivity (92.6%) and moderate specificity (61.5%) for identifying severe cirrhosis.

CONCLUSION

Serum prolactin levels showed a significant and progressive increase across Child–Pugh classes and demonstrated a moderate positive correlation with

Child–Pugh score. The relatively high sensitivity and good area under the ROC curve suggest that serum prolactin may have potential as a simple, non-invasive adjunct biomarker for identifying patients with severe cirrhosis. However, its moderate specificity indicates that serum prolactin should not be used as a standalone marker and should be interpreted alongside established clinical and biochemical assessment tools. As this was a single-centre cross-sectional study and mortality outcomes were not directly assessed, further prospective, multicentric studies with serial prolactin measurements and clinically relevant outcomes are required to establish its independent prognostic value.

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