Original Research Paper

Volume - 15 | Issue - 09 | September - 2025 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Medicine

CHRONIC LIVER DISEASE IN WOMEN AND ITS CLINICAL PROFILE - A HOSPITAL BASED STUDY.

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ABSTRACT **Background:** Chronic liver disease (CLD) is a major cause of morbidity and mortality worldwide. In women, the etiological spectrum and clinical profile differ from men due to hormonal, metabolic and autoimmune influences. Data on female-specific CLD patterns in India remain limited. **Objectives:** To evaluate the clinical and etiological profile of CLD in women. Methods: This cross-sectional observational study was conducted in the Department of General Medicine at Government Medical College, Chhatrapati Sambhajinagar, Maharashtra, from January to June 2025. A total of 41 adult female patients with CLD were included. Clinical history, risk factors, examination findings, laboratory investigations, imaging and endoscopic evaluation were recorded. Severity was assessed using the Child–Turcotte–Pugh (CTP) classification. Data were analyzed as frequencies, percentages and means. **Results:** The mean age of patients was 36.8 ± 11.6 years, with the majority in the 30–39 years (31.7%) and 40–49 years (31.7%) age groups. Common risk factors included obesity (34.1%), diabetes mellitus (26.8%) and metabolic syndrome (24.4%). Abdominal distension (80.5%), anorexia (65.9%), jaundice (58.5%) and pedal edema (53.7%) were the predominant symptoms. The leading etiologies were NAFLD/NASH (22.0%), hepatitis C (17.1%), cryptogenic (17.1%) and hepatitis B (14.6%), while alcoholic liver disease was rare (4.9%). Splenomegaly (43.9%) and spider angioma (29.3%) were common signs. Most patients were in CTP Class B (51.2%) or C (41.5%). Major complications included ascites (68.3%), coagulopathy (43.9%) and variceal bleeding (29.3%). **Conclusion:** CLD in women in the present study most commonly presented in the reproductive and perimenopausal age groups (30–49 years). Metabolic, viral and autoimmune etiologies predominate, while alcohol contributes minimally. Early screening and gender-focused preventive strategies are essential to reduce disease burden.

KEYWORDS : Chronic liver disease, Women, NAFLD, Viral hepatitis, Autoimmune hepatitis, Child–Pugh score

INTRODUCTION

Chronic liver disease (CLD) is defined as a long-standing decline in hepatic function persisting for more than six months. It represents a continuous inflammatory and degenerative process within the liver parenchyma that is only partially compensated by regeneration, eventually progressing to fibrosis and cirrhosis [1,2]. Cirrhosis, the advanced stage of CLD, is characterized by architectural distortion of the liver, the formation of regenerative nodules and widespread deposition of fibrous tissue. Globally, CLD is recognized as a major contributor to mortality, affecting populations in both developed and developing regions [1,2].

Gender-based differences in CLD have been increasingly recognized. Epidemiology, clinical presentation and outcomes differ between men and women, which may be explained by the modulatory effects of sex hormones, variation in gene expression and differences in immune regulation [1,3]. In women, conditions such as autoimmune hepatitis, primary biliary cholangitis, toxin-induced liver injury and acute hepatic failure are more frequently observed. Conversely, men are more often affected by chronic viral hepatitis and hepatocellular carcinoma [3].

Chronic liver disease (CLD) is increasingly recognized as a significant public health concern in India. Among the various etiologies, non-alcoholic fatty liver disease (NAFLD) and alcoholic liver disease (ALD) are emerging as major contributors, reflecting the ongoing changes in lifestyle, diet and social practices. Considerable regional variability in the causes of CLD is also observed across this geographically and ethnically diverse country. Despite these trends, hepatitis B continues to remain a leading cause of CLD and an important driver of liver cancer in India. [4]

Cirrhosis remains a global health burden and is among the leading causes of death worldwide. It was reported as the 11th most common cause of death in 2016 and accounted for approximately 1.32 million deaths in 2017. Of these, nearly two-thirds were in men and one-third in women. The predominant etiologies worldwide are metabolic dysfunction–associated fatty liver disease (MAFLD), chronic hepatitis B (HBV), chronic hepatitis C (HCV) and alcohol-related liver disease. With advances in antiviral therapy, the prevalence of viral hepatitis is declining, while MAFLD is emerging as the dominant cause [5]. Among women, viral hepatitis—particularly hepatitis B and C—continues to be a major cause of CLD. Many patients with hepatitis C remain asymptomatic for prolonged periods and the disease is often diagnosed incidentally during evaluation for other conditions [6].

Although women are less frequently affected by cirrhosis and hepatocellular carcinoma compared to men, CLD in females presents distinct clinical challenges. Reproductive health is a significant concern, as cirrhosis is often associated with oligo- or anovulation. This may be related to hypothalamic–pituitary axis disturbances as well as altered metabolism of sex hormones within the diseased liver. In addition, pregnancy in women with CLD or cirrhosis carries substantial risks for both maternal and fetal health outcomes, underscoring the need for heightened clinical vigilance in this group. [7]

Objectives: To evaluate the clinical and etiological profile of CLD in women.

METHODOLOGY

Study Design: This was a cross-sectional observational study conducted in the Department of General Medicine at Government Medical College, Chhatrapati Sambhajinagar, Maharashtra, India. The study was carried out over a period of six months, from January 2025 to June 2025. Ethical approval was obtained from the Institutional Ethics Committee prior to the commencement of the study. Written informed consent was obtained from all participants before their inclusion in the study.

Study Population

- **Sample Size:** 41 patients
- **Sampling Method:** Non-probability consecutive sampling

Inclusion Criteria

Adult females (>18 years) diagnosed with chronic liver disease (CLD) based on clinical, biochemical and radiological criteria

Exclusion Criteria

Patients <18 years and those who did not consent

Data Collection

All patients were evaluated for age, comorbidities, socio-economic status, addictions, presenting symptoms and complications. A detailed clinical evaluation, including history and physical examination, was recorded using a predefined proforma. Laboratory investigations were performed for all patients and included a complete hemogram, urine routine examination with microscopy, fasting blood glucose estimation, renal function tests (RFT) and liver function tests (LFT).

Coagulation profile was assessed using prothrombin time (PT), international normalized ratio (INR) and activated partial thromboplastin time (aPTT). Serological testing for viral markers such as hepatitis B surface antigen (HBsAg), anti-hepatitis C virus (anti-HCV) and human immunodeficiency virus (HIV) was carried out in all cases. Stool examination for occult blood was performed wherever indicated. Imaging and procedures included abdominal ultrasonography for assessment of liver size, echotexture, nodularity, splenomegaly and ascites. In patients with ascites, fluid analysis was done as indicated, including serum–ascites albumin gradient (SAAG), cytology, biochemical parameters and culture. Upper gastrointestinal endoscopy was performed in relevant cases to evaluate varices and portal hypertensive changes. Autoimmune hepatitis markers, such as antinuclear antibody (ANA) and other autoantibodies, were assessed in patients with suspected autoimmune etiology.

Statistical Analysis

Statistical analysis was performed using Microsoft Excel. Quantitative variables were expressed as mean ± standard deviation (SD) for normally distributed data or as median with range for skewed data. Categorical variables were summarized as frequencies and percentages.

RESULTS

A total of 41 female patients with chronic liver disease (CLD) were included in the present study. The age of patients ranged from 23 to 68 years, with a mean age of 36.8 ± 11.6 years. As shown in Table 1, the majority of patients were in the 30–39 years (31.7%) and 40–49 years (31.7%) age groups, followed by 50–59 years (22.0%). A smaller proportion were aged ≥60 years (9.7%) while only 4.9% of patients were below 30 years of age. Risk factor analysis (Table 1) revealed that obesity (34.1%), diabetes mellitus (26.8%) and metabolic syndrome (24.4%) were the leading contributors to CLD in women. Other significant factors included hypertension (22.0%), dyslipidemia (19.5%) and multiparity (14.6%). Autoimmune predisposition was documented in 12.2% of cases. Only 4.9% reported alcohol use disorder, much lower than in male cohorts, consistent with the gender-specific risk profile in India.

The most common presenting symptom was abdominal distension, seen in 80.5% of patients. This was followed by anorexia (65.9%), jaundice (58.5%) and pedal edema (53.7%). Upper gastrointestinal bleeding (hematemesis/melena) was documented in 36.6% of cases, while abdominal pain, fever and easy bruising were observed less frequently. These findings are summarized in Table 2. The distribution of etiologies among women with CLD is shown in Table 2. The most frequent etiology was non-alcoholic fatty liver disease (NAFLD/NASH), accounting for 22.0% of cases. This was followed by viral hepatitis C (17.1%) and cryptogenic CLD (17.1%). Hepatitis B accounted for 14.6% of cases, while autoimmune hepatitis was present in 12.2%. Other less frequent causes included primary biliary cholangitis (4.9%), alcoholic liver disease (4.9%), Wilson's disease (2.4%) and hemochromatosis (2.4%).

On clinical examination (Table 2), splenomegaly was observed in 43.9% of patients. Loss of body hair was seen in 36.6%, while spider angioma was noted in 29.3%. Only 4.9% of patients showed parotid enlargement, reflecting a smaller contribution of alcohol-related CLD in women. Upper gastrointestinal endoscopy findings are presented in Table 3. Esophageal varices were the most common finding, seen in 36.6% of patients, followed by portal hypertensive gastropathy (17.1%). Gastric varices (7.3%) and gastric erosion (4.9%) were less frequently noted. As shown in Table 3, elevated transaminases were common, with abnormal AST levels in 68.3% and abnormal ALT in 61.0%. Hypoalbuminemia (<3 g/dL) was documented in 43.9% of cases, while 36.6% had serum albumin between 3–3.5 g/dL. Hyperbilirubinemia (>3 mg/dL) was noted in 24.4% of patients.

The severity of CLD was classified using the Child–Turcotte–Pugh (CTP) score (Table 3). The majority of patients were in CTP Class B (51.2%), followed by Class C (41.5%), indicating advanced disease at presentation. Only 7.3% of patients were in Class A, reflecting compensated cirrhosis. The most frequent complication was ascites, seen in 68.3% of cases, followed by coagulopathy (43.9%) and variceal bleed (29.3%). Hepatic encephalopathy was present in 24.4% of patients, while spontaneous bacterial peritonitis (17.1%) and hepatorenal syndrome (12.2%) were less common. Details are provided in Table 3.

Table 1: Age Distribution and Risk Factors in Female CLD Patients (n = 41)

Category	Variable	Patients (n)	Percentage (%)
Age Group (years)	<30	2	4.9
	30–39	13	31.7
	40–49	13	31.7
	50–59	9	22.0
	≥60	4	9.7
Risk Factors*	Obesity / Overweight (BMI >25)	14	34.1
	Type 2 Diabetes Mellitus	11	26.8
	Metabolic Syndrome (≥3 components)	10	24.4
	Hypertension	9	22.0
	Dyslipidemia	8	19.5
	Autoimmune tendency	5	12.2
	Family history of liver disease	4	9.8
	Use of hepatotoxic drugs	4	9.8
	Alcohol use disorder	2	4.9

*Multiple responses noted for risk factors.

Table 2: Symptoms, Signs, and Etiological Distribution of Female CLD Patients (n = 41)

Category	Variable	Patients (n)	Percentage (%)
Symptoms*	Abdominal distension	33	80.5
	Anorexia	27	65.9
	Jaundice	24	58.5
	Pedal edema	22	53.7
	Upper GI bleed	15	36.6
	Abdominal pain	13	31.7
	Fever	8	19.5
	Easy bruising	6	14.6
Signs	Splenomegaly	18	43.9
	Loss of body hair	15	36.6
	Spider angioma	12	29.3
	Parotid enlargement	2	4.9
Etiology	NAFLD/NASH	9	22.0
	Hepatitis C	7	17.1
	Cryptogenic	7	17.1
	Hepatitis B	6	14.6
	Autoimmune hepatitis	5	12.2
	Primary biliary cholangitis	2	4.9
	Alcoholic liver disease	2	4.9
	Wilson's disease	1	2.4
	Hemochromatosis	1	2.4

Table 3: Endoscopic, Biochemical, Severity, and Complication Profile of Female CLD Patients (n = 41)

Category	Variable	Patients (n)	Percentage (%)
Endoscopic Findings	Esophageal varices	15	36.6
	Portal hypertensive gastropathy	7	17.1
	Gastric varices	3	7.3
	Gastric erosion	2	4.9
Biochemical Profile	ALT – Abnormal	25	61.0
	AST – Abnormal	28	68.3
	Albumin <3 g/dL	18	43.9
	Albumin 3–3.5 g/dL	15	36.6
	Albumin >3.5 g/dL	8	19.5
	Bilirubin <2 mg/dL	17	41.5
	Bilirubin 2–3 mg/dL	14	34.1
	Bilirubin >3 mg/dL	10	24.4
Child–Turcotte–Pugh (CTP) Class	Class A	3	7.3
	Class B	21	51.2
	Class C	17	41.5
Complications	Ascites	28	68.3
	Coagulopathy	18	43.9
	Variceal bleed	12	29.3

	Hepatic encephalopathy	10	24.4
	Spontaneous bacterial peritonitis	7	17.1
	Hepatorenal syndrome		

DISCUSSION

In the present study, we evaluated the clinical profile of 41 female patients with chronic liver disease (CLD) admitted to our hospital. The majority of patients were in the 30–39 years (31.7%) and 40–49 years (31.7%) age groups, with a mean age of 36.8 years. This indicates that CLD in women tends to present more commonly in the reproductive and perimenopausal age groups, rather than being confined to post-menopausal women. Chatterjee et al. [1] also reported that middle-aged women were most frequently affected, particularly with metabolic-associated steatohepatitis (MASH) and autoimmune hepatitis. Isabella et al. [8] documented a lower mean age of 44.3 years, with the majority of patients in the 31–50-year range, highlighting regional and etiological variability. Similarly, Suresh et al. [9] observed that the peak incidence occurred between 41–60 years in their cohort, while Shrestha et al. [10] reported 37.7% of patients above 60 years. Behera et al. [12] found a comparable mean age of 48.3 years. Collectively, these findings suggest that while CLD in women often manifests clinically during the 5th and 6th decades, our study emphasizes a significant burden even among younger and middle-aged females, underscoring the need for early recognition and timely intervention.

Our study highlights obesity (34.1%), diabetes mellitus (26.8%) and metabolic syndrome (24.4%) as the most common risk factors. Hypertension (22%), dyslipidemia (19.5%), multiparity (14.6%) and autoimmune predisposition (12.2%) were also significant. Alcohol use disorder was rare (4.9%). This aligns with Chatterjee et al. [1], who emphasized metabolic and autoimmune causes in females, while alcohol was negligible. Isabella et al. [8] also identified metabolic factors, though cryptogenic CLD was more frequent in their cohort (38.3%). In contrast, Suresh et al. [9] and Shrestha et al. [10] reported alcohol-related disease as predominant in overall cohorts, though less so in women. Chaurasiya et al. [11] highlighted alcohol and hepatitis B as major contributors, while Behera et al. [12] noted that viral hepatitis and alcohol remained important in their cohort. The differences underscore that female physiology and social habits protect against alcohol-related disease, while metabolic and autoimmune risks dominate.

The most common symptom in our cohort was abdominal distension (80.5%), followed by anorexia (65.9%), jaundice (58.5%) and pedal edema (53.7%). Upper gastrointestinal bleeding (36.6%) was also a significant presenting complaint. Isabella et al. [8] reported abdominal distension (85%), anorexia (73.3%), and jaundice (56.7%) as the most frequent presentations, closely matching our findings. In comparison, Chatterjee et al. [1] found pallor and icterus to be the most frequent clinical findings, while Suresh et al. [9] reported abdominal distension (87.5%) and jaundice (80.5%) as predominant complaints. Behera et al. [12] also documented weakness (92%), yellowish discoloration (91%) and abdominal distension (88%) as common symptoms. These observations suggest that abdominal swelling, jaundice and systemic weakness remain hallmark presentations of CLD across different populations, though subtle differences exist in frequency across regions.

In our study, the leading causes of CLD among women were NAFLD/NASH (22.0%), hepatitis C (17.1%), cryptogenic disease (17.1%) and hepatitis B (14.6%). Autoimmune hepatitis accounted for 12.2% of cases, while alcoholic liver disease was seen in only 4.9% of female patients. Isabella et al. [8], however, found cryptogenic CLD to be the most common cause (38.3%), with hepatitis C (15%) and hepatitis B (10%) following, and NAFLD contributing to only 5%. Chatterjee et al. [1] also highlighted NAFLD and hepatitis C as the most common etiologies in Indian women, while autoimmune hepatitis was more prevalent in younger age groups. Suresh et al. [9] reported alcohol-related CLD as the most common cause overall, but noted that viral hepatitis B and C accounted for 25–29% of female cases. Shrestha et al. [10] found alcoholic liver disease to be the predominant cause (82.3%) in Nepal, though this reflects male predominance; in females, hepatitis B was more significant. Chaurasiya et al. [11] observed hepatitis B as the most common etiology in women, followed by hepatitis C. Behera et al. [12] similarly noted high frequencies of hepatitis B (16%) and C (9%). Taken together, these findings underscore that etiological patterns in Indian women are shifting toward metabolic (NAFLD/NASH) and autoimmune causes, while viral hepatitis remains a major contributor and alcohol use plays a relatively minor role.

In our cohort, splenomegaly (43.9%), loss of body hair (36.6%) and spider angioma (29.3%) were the most frequent physical signs. Parotid enlargement, a stigmata of alcohol-related CLD, was rare (4.9%), reflecting the lower prevalence of alcohol use among women. Isabella et al. [8] also reported similar findings, with splenomegaly (43.3%) and loss of body hair (43.3%) being frequent. Chatterjee et al. [1] described pallor and icterus as common signs in females, while Suresh et al. [9] noted icterus in 87.5% and pedal edema in 63%. Behera et al. [12] documented similar frequencies of icterus (91%) and edema (61%). These variations likely reflect gender differences in lifestyle exposures and comorbid conditions.

Esophageal varices (36.6%) and portal hypertensive gastropathy (17.1%) were the most common endoscopic findings in our study. Isabella et al. [8] found esophageal varices in 36.7%, an almost identical observation. Suresh et al. [9] reported esophageal varices in 74.6% of cases, while Chaurasiya et al. [11] noted that Grade II–III varices were the predominant form in patients with portal hypertension. The lower prevalence of varices in our female cohort may be attributed to earlier detection and referral, as well as differences in the underlying etiology (more metabolic and autoimmune disease, less alcohol-related cirrhosis).

In our study, abnormal AST (68.3%) and abnormal ALT (61.0%) were frequent. Hypoalbuminemia (<3 g/dL) was noted in 43.9%, while hyperbilirubinemia (>3 mg/dL) was seen in 24.4%. Isabella et al. [8] reported abnormal AST in 70% and hypoalbuminemia in 43.3%, which closely mirrored our findings. Chatterjee et al. [1] reported similar derangements, with raised bilirubin in 96% and albumin <3.5 g/dL in 97%. Suresh et al. [9] also noted hypoalbuminemia (97%) and deranged transaminases (>85%) in the majority. Behera et al. [12] observed mean serum albumin of 2.27 g/dL and mean bilirubin of 6.16 mg/dL. These findings confirm that biochemical abnormalities, especially hyperbilirubinemia and hypoalbuminemia, are consistent hallmarks of advanced CLD in females.

The majority of our patients were in CTP Class B (51.2%), followed by Class C (41.5%), with only 7.3% in Class A. This is consistent with Chatterjee et al. [1], who reported most women presenting with decompensated disease. Isabella et al. [8] also reported frequent decompensation, with 77.7% of patients in Class B or C. Similarly, Behera et al. [12] found 53% in Class B and 45% in Class C. Suresh et al. [9] documented a similar trend, with half the patients in advanced stages. These results highlight that women often present late in the disease course, reinforcing the need for earlier detection strategies.

The most frequent complication in our study was ascites (68.3%), followed by coagulopathy (43.9%), variceal bleed (29.3%) and hepatic encephalopathy (24.4%). Isabella et al. [8] reported coagulopathy (41.6%) and spontaneous bacterial peritonitis (16.7%) at similar frequencies. Chatterjee et al. [1] found ascites in 70% of cases and encephalopathy in 7.5%. Suresh et al. [9] documented encephalopathy in 37.5%, variceal bleeding in 36% and SBP in 19.5%. Behera et al. [12] reported encephalopathy (36%), UGI bleeding (30%) and sepsis (18%). The relatively lower encephalopathy rate in our series may reflect better supportive management in females or milder alcohol-related disease compared to male-dominated cohorts.

CONCLUSION

Chronic liver disease (CLD) in women in the present study predominantly affected those in the third and fourth decades of life, with the majority of patients in the 30–49-year age group. Most patients presented in advanced stages (Child–Turcotte–Pugh Class B/C). The leading etiologies identified were NAFLD/NASH, viral hepatitis and autoimmune hepatitis, while alcohol-related disease contributed minimally. Abdominal distension, jaundice and pedal edema were the most frequent clinical manifestations, with ascites and coagulopathy as the commonest complications. Metabolic and reproductive factors such as obesity, diabetes, hypertension and multiparity emerged as key female-specific risks. These findings underscore the need for early screening, preventive strategies and gender-focused management approaches to reduce morbidity and mortality among women with CLD.

Limitations

The present study has certain limitations that should be acknowledged. Firstly, it was conducted at a single tertiary care center with a relatively small sample size of 41 patients, which may limit the generalizability of the findings to the wider population. Secondly, the study was cross-sectional in design and therefore could not assess disease progression, long-term outcomes, or survival patterns among female patients with CLD.

Conflict of Interest: Nil
Funding: None

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