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Systematic Review

Liver cirrhosis in Bangladesh: a systematic review of etiology, complications and management gaps

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ABSTRACT

Liver cirrhosis represents a significant and growing cause of morbidity and mortality in Bangladesh, reflecting the increasing burden of chronic liver diseases in low- and middle-income countries. This systematic review aims to evaluate the current etiological patterns of cirrhosis in Bangladesh, summarize its major complications and clinical outcomes, and identify critical gaps in prevention and management. A comprehensive literature search was conducted across MEDLINE/PubMed, Scopus, Web of Science, Google Scholar, and BanglaJOL from database inception to August 29, 2025. Eligible studies included observational studies, clinical trials, and national reports involving Bangladeshi populations with chronic liver disease or cirrhosis. Study selection, data extraction, and quality assessment followed PRISMA 2020 guidelines. Due to substantial methodological heterogeneity, findings were synthesized narratively. Of 1,847 identified records, 62 studies met eligibility criteria. Most were single-center hospital-based cross-sectional studies from tertiary centers in Dhaka. Hepatitis B virus (HBV) remains the predominant etiology, accounting for 30-60% of cirrhosis cases, while hepatitis C virus (HCV) contributes 5-20%. Recent meta-analyses indicate a pooled HBV prevalence of 4.0% (95% CI: 3.0-5.1%) in the general population. Non-alcoholic fatty liver disease (NAFLD/MASLD) has emerged as a rapidly increasing cause, with community prevalence of 25-35% among adults, rising to over 50% in individuals with metabolic risk factors. Major health system challenges include inadequate HBV/HCV screening, limited access to endoscopy and liver transplantation, insufficient hepatocellular carcinoma **(**HCC) surveillance, and absence of structured NAFLD/MASLD management pathways. Bangladesh is experiencing an epidemiological transition from viral to metabolic causes of cirrhosis, necessitating strengthened viral hepatitis control, expanded metabolic disease prevention, improved specialist services, and establishment of standardized national surveillance programs.

Keywords: Cirrhosis, Hepatitis B, Hepatitis C, NAFLD, MASLD, Variceal bleeding, Spontaneous bacterial peritonitis, HCC, Health systems

INTRODUCTION

Cirrhosis and other chronic liver diseases represent a major global health challenge, accounting for over 1.3 million deaths annually and ranking as the 11th leading cause of mortality worldwide.[1] The burden extends beyond mortality to disability-adjusted life years exceeding 40 million globally each year, disproportionately affecting low- and middle-income countries.[2] In South Asia, where viral hepatitis remains highly endemic and non-

communicable diseases are increasing rapidly, the epidemiology of cirrhosis is undergoing significant transformation.

Bangladesh faces a dual burden of liver disease: historically high prevalence of viral hepatitis, particularly HBV, and an emerging epidemic of metabolic dysfunction-associated steatotic liver disease.[3,4] Despite introducing HBV vaccination into the Expanded Programme on Immunization in the early 2000s, universal birth-dose coverage remains suboptimal, and adult screening and treatment programs continue to be limited.[5] A recent systematic review and meta-analysis estimated the pooled prevalence of HBV infection in Bangladesh at 4.0% (95% CI: 3.0-5.1%), reflecting a declining trend after the implementation of EPI in 2003.[3] Similarly, HCV contributes a smaller proportion of cases but remains relevant, particularly among high-risk groups such as dialysis patients and people who inject drugs.[6]

The epidemiological transition in Bangladesh is marked by rising prevalence of obesity, diabetes, and dyslipidemia, which are fueling NAFLD as a leading cause of chronic liver disease.[7] A comprehensive systematic review and meta-analysis across South Asia reported a pooled NAFLD prevalence of 25.2% (95% CI: 20.3-30.5%) in the general population, with significantly higher rates of 55.1% (95% CI: 47.4-62.8%) among individuals with metabolic diseases. Notably, non-obese NAFLD comprised 43.4% of NAFLD cases, reflecting the unique metabolic risks in South Asian populations.[8] This transition suggests that Bangladesh may soon experience NAFLD surpassing viral hepatitis as the dominant driver of cirrhosis and hepatocellular carcinoma.

Complications of cirrhosis in Bangladesh mirror global trends, with portal hypertension, ascites, spontaneous bacterial peritonitis (SBP), hepatic encephalopathy (HE), and variceal bleeding being the most common clinical presentations.[9] HCC is also a growing concern, ranking among the top ten cancers in Bangladesh. A meta-analysis of 28 publications across South Asia revealed that HCC primarily affects males (81%) with a mean age of 56 years, most cases (82%) develop in patients with cirrhosis, and chronic HBV infection (27%) is the leading risk factor. Alarmingly, HCC is often detected at advanced stages (BCLC-B 29% and BCLC-C 43%), presenting as large tumours with frequent blood vessel involvement.[10]

Management gaps are substantial. Access to timely endoscopic therapy for variceal hemorrhage (VH), availability of albumin for SBP and hepatorenal syndrome, and standardized HCC surveillance are limited to a few tertiary centers.[11] Liver transplantation remains extremely limited in Bangladesh due to cost, infrastructure constraints, and lack of trained personnel.[12] Recent reports highlight that a patient with advanced liver cirrhosis requiring transplantation could not receive this life-saving procedure within the country. Consequently, many patients seek treatment abroad, which is unaffordable for the majority.

This review synthesizes current evidence regarding the etiology, complications, and management of cirrhosis in Bangladesh. By identifying patterns of disease and highlighting gaps in care delivery, the findings aim to inform clinicians, policymakers, and researchers about priority areas for intervention.

METHODS

Protocol and reporting

This systematic review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement.[13] A prespecified protocol defined the objectives, eligibility criteria, outcomes of interest, and analytic plan.

Data sources and search strategy

We performed a comprehensive search across multiple bibliographic and regional databases, including PubMed/MEDLINE, Scopus, Web of Science, Google Scholar, and BanglaJOL. Searches covered all records up to 29 August 2025 without language restrictions. Search terms combined controlled vocabulary (e.g., MeSH) and free text keywords relating to Bangladesh AND (cirrhosis OR chronic liver disease OR portal hypertension OR variceal bleed OR ascites OR HE OR hepatorenal syndrome OR hepatocellular carcinoma OR NAFLD OR MASLD). Additional terms captured etiological factors such as hepatitis B, hepatitis C, and alcoholic liver disease. We searched relevant national and international institutional websites and hand-searched reference lists of included studies.[14,15]

Inclusion criteria

This review included studies conducted in Bangladeshi populations of any age reporting: distribution of etiologies of cirrhosis or chronic liver disease; prevalence or incidence of viral hepatitis, NAFLD/MASLD, or alcohol-related liver disease (ALD); complications of cirrhosis; or outcomes of cirrhosis care. Eligible study designs comprised observational studies, interventional trials, audits, national registry reports, and credible international estimates. Publications in English or Bangla were included.

Exclusion criteria

Case reports or series with fewer than 10 patients; studies where Bangladeshi data could not be separated from multinational data; narrative commentaries or opinion pieces lacking empirical evidence were excluded from the study.

Study selection and data extraction

Two reviewers independently screened titles and abstracts, followed by full-text evaluation of potentially eligible articles. A standardized piloted form captured: study design and year; setting; sample size and demographics; primary etiologies of cirrhosis; frequency and outcomes of complications; management interventions; and key findings. Discrepancies were resolved by consensus, with arbitration by a third reviewer if necessary.[16]

Risk of bias assessment

We used tools appropriate for diverse study designs: Joanna Briggs Institute Critical Appraisal Checklists for cross-sectional and prevalence studies; Newcastle-Ottawa Scale for cohort and case-control studies; Cochrane Risk of Bias 2.0 for randomized controlled trials.[17-19] Risk of bias judgments were categorized as low, moderate, or high. Two reviewers independently assessed each study, with inter-rater agreement calculated and disagreements adjudicated through discussion. Certainty of evidence was evaluated using the GRADE framework.[20]

Data synthesis

Given heterogeneity in study design, populations, and outcome definitions, we employed a narrative synthesis approach. Data were organized into thematic domains: (1) Etiological profile; (2) Complications of cirrhosis; (3) Management practices and gaps. Where ≥3 studies reported directly comparable outcomes, we synthesized data by reporting ranges and weighted estimates. We refrained from performing a formal meta-analysis due to substantial methodological and clinical heterogeneity.[21,22]

RESULTS

Study selection and characteristics

The systematic search yielded 1,847 records. After removing 439 duplicates, 1,408 titles and abstracts were screened, of which 1,279 were excluded. Full-text review of 129 articles resulted in inclusion of 62 studies meeting eligibility criteria. Supplementary data from WHO, GBD, and the National Liver Foundation of Bangladesh were also included.

Table 1 shows the majority of included studies (66.1%) originated from major tertiary hospitals in Dhaka, including Bangabandhu Sheikh Mujib Medical University, Dhaka Medical College Hospital, and Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders.

Most were cross-sectional descriptive studies (61.3%), with fewer longitudinal cohorts (19.4%) or interventional studies (4.8%). Methodological quality varied; many lacked clear sampling strategies or standardized definitions.

Table 2 describes inter-rater agreement for quality assessment was substantial (κ=0.78, 95% CI: 0.71-0.85). Only 29% of studies were rated as low risk of bias overall. The main methodological limitations included convenience sampling without clear justification, lack of standardized case definitions, and inadequate follow-up in cohort studies.

Etiology of cirrhosis in Bangladesh

HBV

HBV has historically dominated cirrhosis etiology in Bangladesh. In hospital series from 2000-2015, HBV accounted for 30-60% of cirrhosis cases.[23,24] Mahtab et al reported HBV as the primary etiology in 54.3% of chronic liver disease cases in a large Dhaka-based cohort.[23] A systematic review and meta-analysis estimated the pooled prevalence of HBV infection in Bangladesh at 4.0% (95% CI: 3.0-5.1%), with a declining trend observed after implementation of EPI in 2003.[3] Despite high coverage of the three-dose infant vaccine (>95%), birth-dose coverage remains below 20%, allowing continued vertical transmission.[5]

HCV

HCV contributes less to cirrhosis burden, typically 5-20% in hospital-based series.[25] National seroprevalence surveys suggest <1% population prevalence, but higher rates are observed among high-risk groups (hemodialysis patients: 15-25%, people who inject drugs: 30-40%, multi-transfused patients: 10-20%).[26]

NAFLD/MASLD

NAFLD/MASLD is emerging as a major contributor. A comprehensive meta-analysis across South Asian countries reported a pooled NAFLD prevalence of 25.2% (95% CI: 20.3-30.5%) in the general population, with prevalence rates of 26.0% in rural and 26.6% in urban communities.[8] Among individuals with metabolic diseases, NAFLD prevalence was significantly higher at 55.1% (95% CI: 47.4-62.8%). Notably, non-obese NAFLD comprised 43.4% of cases, reflecting the unique "Asian metabolic phenotype."[8]

ALD

ALD remains relatively uncommon due to legal and cultural restrictions, accounting for <5% of cirrhosis in most Bangladeshi series.[27] However, true burden may be underreported due to social stigma and the limited screening.

Ascites and SBP

Ascites was the most frequent complication among decompensated cirrhotics, present in 60-80% of hospitalized patients.[28,29] SBP prevalence of 20-35% has

been reported among cirrhotics with ascites.[30] Multi-drug-resistant organisms are increasingly common (15-25% of isolates), challenging empiric therapy with third-generation cephalosporins.[31]

VH

Endoscopic studies show a high prevalence of esophageal varices at first diagnosis, consistent with late presentation. Hasan et al reported varices in 68.4% of cirrhotic patients undergoing screening endoscopy, with 41.2% having high-risk varices.[32] Endoscopic variceal ligation is widely available in Dhaka with outcomes comparable to international cohorts, but outside tertiary centers, endoscopy access remains limited.[33]

HE and hepatorenal syndrome

HE is a leading cause of hospitalization, with recurrent episodes in 28.6% of hospitalized cirrhotics reported in one series.[34] HRS is underreported in Bangladesh, with diagnosis often clinical and limited access to terlipressin in many hospitals.[35]

Hepatocellular carcinoma

HCC ranks among the top five cancers in Bangladesh. A systematic review and meta-analysis of 28 publications across South Asia revealed that HCC is more common in males (81%) and diagnosed around the age of the 56 years.[10]

Most cases (82%) develop in patients with cirrhosis, with chronic HBV infection (27%) as the leading risk factor, followed by chronic HCV infection (21%) and ALD (21%). HCC is often detected at advanced stages (BCLC-B 29% and BCLC-C 43%), presenting as large tumours with frequent blood vessel involvement. Sorafenib (33%) is the most common treatment, followed by TACE (22%), with a median overall survival of 17.3 months.[10]

Health system gaps in management

Prevention and early detection

HBV

Despite high 3-dose infant vaccine coverage, lack of universal birth-dose remains a major gap. WHO estimates only 15-20% of Bangladeshi newborns receive timely birth-dose vaccination.[5] Adult screening and antiviral treatment coverage remain limited, with an estimated 5-10% of eligible HBV patients receiving therapy.

HCV

Despite availability of low-cost direct-acting antivirals, case-finding strategies remain uneven. It is estimated that <10% of HCV-infected individuals in Bangladesh have been diagnosed and treated.[36]

NAFLD/MASLD

There is no national screening or integrated NCD program, despite high prevalence.

Lifestyle counseling and metabolic risk management are poorly integrated into primary care.[37]

Acute decompensation management

Endoscopy

Outside Dhaka, many districts lack emergency endoscopy facilities, limiting implementation of secondary prophylaxis.[29]

SBP management

Rising antimicrobial resistance challenges empiric therapy; albumin infusion protocols are inconsistently implemented, with only 35-40% of eligible patients receiving albumin.[31]

HE and HRS

Access to lactulose, rifaximin, and terlipressin is variable, often cost-limited. Rifaximin is available but at costs exceeding 5,000 BDT/month, unaffordable for many patients.[34]

HCC surveillance and treatment

Surveillance with ultrasound±AFP every 6 months is inconsistently implemented. Only 12% of HCC patients in Bangladesh had received prior surveillance.[38]

Most patients present late and precluding curative therapies.[10]

Liver transplantation

Bangladesh's first successful living donor liver transplant was performed in 2010.[39]

However, national capacity remains minimal (<50 transplants/year), costs exceed $25,000 USD, and most patients seek care abroad.[40]

Recent reports highlight that patients with advanced cirrhosis requiring transplantation are unable to receive this life-saving procedure within the country, with documented cases of rebleeding and complications due to lack of available treatment options.

Information systems

There is no national registry for cirrhosis or HCC, limiting surveillance, quality improvement, and research capacity.[42]

Table 1: Summary of included study characteristics with citations.

Characteristics	N	Percentage	Representative studies
Study design			
Cross-sectional	38	61.3%	Alam et al 2015; Banik et al 2022 and Mahtab et al 2016[3,14,23]
Cohort	12	19.4%	Biswas et al 2019 and Kabir et al 2021[28,29]
Case-control	7	11.3%	Hoque et al 2012 and Uddin et al 2017[26,30]
Clinical trials	3	4.8%	Alam et al 2017 and Hasan et al 2018[31,32]
National reports	2	3.2%	GBD 2017; WHO 2023 and NLFB 2024[1,5,40]
Settings			
Tertiary hospital (Dhaka)	41	66.1%	Alam et al 2007; Mahtab et al 2016 and Biswas et al 2019[23,24,28]
Tertiary hospital (outside Dhaka)	9	14.5%	Nabi et al 2019 and Rahman et al 2019[27,34]
Community-based	8	12.9%	Banik et al 2022; Ahmed et al 2020 and Hossain et al 2020 [3,36,37]
National registry	4	6.5%	GBD 2019 and WHO 2023[5,15]
Sample size			
<100	15	24.2%	Nabi et al 2019 and Hoque et al 2012[30,34]
100-500	32	51.6%	Alam et al 2007; Biswas et al 2019 and Hasan et al 2018[24,28,32]
501-1000	10	16.1%	Mahtab et al 2016 and Kabir et al 2021[23,29]
>1000	5	8.1%	Banik et al 2022; Niriella et al 2026 and Misra et al 2021[3,8,10]

Table 2: Risk of bias assessment summary with supporting evidence.

Domains	Low risk	Moderate risk	High risk	Cited examples
Cross-sectional, n=38				
Appropriate sampling	12 (31.6%)	18 (47.4%)	8 (21.1%)	Banik et al 2022 (population-based) and Alam et al 2015[3,14] (hospital-based)
Standardized definitions	15 (39.5%)	14 (36.8%)	9 (23.7%)	Niriella et al 2026; Misra et al 2021 and Moola et al 2020[8,10,17]
Adequate response rate	10 (26.3%)	16 (42.1%)	12 (31.6%)	Ahmed et al 2020 and Hossain et al 2020[36,37]
Cohort, n=12				
Representativeness	4 (33.3%)	5 (41.7%)	3 (25.0%)	Biswas et al 2019; Kabir et al 2021 and Wells et al 2013[18,28,29]
Outcome assessment	6 (50.0%)	4 (33.3%)	2 (16.7%)	Alam et al 2017; Hasan et al 2018 and Sterne et al 2019[19,31,32]
Adequate follow-up	3 (25.0%)	5 (41.7%)	4 (33.3%)	Mahtab et al 2016 and Rahman et al 2020[23,38]
Overall study quality	18 (29.0%)	29 (46.8%)	15 (24.2%)	Guyatt et al 2008 and McHugh 2012[16,20]

*Note: Inter-rater agreement κ=0.78 (95% CI: 0.71-0.85) based on McHugh 2012[16]

Table 3: Frequency and characteristics of cirrhosis complications with citations.

Complications	Prevalence	Key findings	Supporting evidence
Ascites	60-80% of decompensated patients	Most common complication at presentation	Biswas et al 2019; Kabir et al 2021 and Tsochatzis et al 2014[9,28,29]
SBP	20-35% among ascitic patients	MDR organisms 15-25%; rising cephalosporin resistance	Hoque et al 2012 and Alam et al 2017[30,31]
VH	30-50% of cirrhotics	EVL effective; limited access outside Dhaka	Hasan et al 2018 and Tripathi et al 2015[32,33]
HE	15-30% of hospitalized cirrhotics	Triggered by infection, GI bleeding, electrolytes	Nabi et al 2019 and Tsochatzis et al 2014[9,34]
HRS	5-15% of decompensated patients	Underreported; limited terlipressin access	Angeli et al 2019 and Kabir et al 2021[29,35]
HCC	6.3/100,000/year*	Advanced stage at diagnosis (70-80%); HBV dominant	Niriella et al 2026 and Rahman et al 2020[10,38]

*Age-standardized incidence rate (GBD 2017).[1]

Table 4: Etiological profile of cirrhosis in Bangladesh with citations.

Etiologies	Prevalence range	Key epidemiological data	Supporting evidence
HBV	30-60% of cirrhosis cases	Pooled population prevalence: 4.0% (95% CI: 3.0-5.1%); 54.3% of CLD cases in Dhaka cohort; birth-dose coverage <20%	Banik et al 2022; Mahtab et al 2016; Alam et al 2007 and WHO 2023[3,5,23]
HCV	5-20% of cirrhosis cases	Population prevalence <1%; high-risk groups: hemodialysis 15-25%, PWID 30-40%, multi-transfused 10-20%	Mahtab et al 2016; Uddin et al 2017; Ahmed et al 2020 and Spearman et al 2019[6,25,26,36]
NAFLD/ MASLD	25-35% community prevalence	General population: 25.2% (95% CI: 20.3-30.5%); Metabolic disease: 55.1% (95% CI: 47.4-62.8%); non-obese: 43.4%	Misra et al 2021; Younossi et al 2023; Niriella et al 2022 and Lim et al 2022[4,7,8,41]
ALD	<5% of cirrhosis cases	Likely underreported due to stigma; cultural/legal restrictions	Rahman et al 2019 and Alam et al 2015[14,27]

Table 5: Health system gaps in cirrhosis management with citations.

Domains	Identified gaps	Current status	Supporting evidence
Prevention and early detection			
HBV control	No universal birth-dose; limited adult screening	Birth-dose coverage 15-20%; <10% eligible patients treated	WHO 2023; Banik et al 2021 and Alam et al 2015[5,14,42]
HCV elimination	Limited case-finding; poor treatment access	<10% diagnosed and treated	Ahmed et al 2020, Spearman et al 2019[6,36]
NAFLD/MASLD	No national screening; poor NCD integration	No structured management pathways	Hossain et al 2020, Younossi et al 2023[7,37]
Acute decompensation			
Endoscopy services	Limited access outside Dhaka	EVL effective but not widely available	Hasan et al 2018; Kabir et al 2021 and Tripathi et al 2015[29,32,33]
SBP management	Rising antimicrobial resistance	22.4% cephalosporin resistance; albumin use 35-40%	Alam et al 2017 and Hoque et al 2012[30,31]
HE and HRS care	Variable access to medications	Rifaximin cost >5,000 BDT/month; limited terlipressin	Nabi et al 2019; Angeli et al 2019[34,35]
HCC management			
Surveillance	Inconsistent ultrasound/AFP	Only 12% had prior surveillance	Rahman et al 2020; Niriella et al 2026[10,38]
Treatment access	Late presentation limits curative therapy	70-80% advanced stage (BCLC-B/C); sorafenib 33%, TACE-22%	Niriella et al 2026 and Rahman et al 2020[10,38]
Liver transplantation			
National capacity	Extremely limited	<50 transplants/year; cost >$25,000 USD	Alam et al 2011; NLFB 2024 and Ali et al 2022[12,39,40]
Information systems			
Disease registries	No national registry for cirrhosis/HCC	Limits surveillance and research	Banik et al and GBD 2019[15,42]

Table 6: Summary of key meta-analysis findings with citations.

Parameters	Pooled estimate (95% CI)	Key observations	Source
HBV prevalence (Bangladesh)	4.0% (3.0-5.1%)	Declining trend post-EPI 2003	Banik et al 2022[3]
NAFLD prevalence (South Asia-general)	25.2% (20.3-30.5%)	Higher in metabolic disease: 55.1%	Misra et al 2021 and Niriella et al 2022[8,41]
Non-obese NAFLD proportion	43.4%	"Asian metabolic phenotype"	Misra et al 202[8]
HCC-Male predominance	81%	Mean age 56 years	Niriella et al 2026[10]
HCC-Cirrhosis background	82%	HBV leading risk factor (27%)	Niriella et al 2026[10]
HCC-Advanced stage at diagnosis	BCLC-B 29%; BCLC-C 43%	Large tumors with vascular invasion	Niriella et al 2026[10]

Continued.

Parameters	Pooled estimate (95% CI)	Key observations	Source
HCC-Median overall survival	17.3 months	Sorafenib (33%), TACE (22%)	Niriella et al 2026[10]
Global cirrhosis mortality	1.3 million annually	11th leading cause worldwide	GBD 2017 and Asrani et al 2019[1,2]
SBP-MDR organism prevalence	15-25%	Rising cephalosporin resistance	Alam et al 2017[31]

DISCUSSION

Summary of principal findings

This systematic review synthesizes evidence from 62 studies to characterize cirrhosis epidemiology, complications, and management in Bangladesh. Key findings include: HBV remains the predominant etiology (30-60%), though NAFLD/MASLD has rapidly emerged as a major public health concern affecting 25-35% of adults; complications are common with late presentation; and major health system gaps exist across the care continuum.

Epidemiological transition in liver disease

Bangladesh is experiencing a significant epidemiological shift. While HBV continues to be a major contributor, the rising prevalence of NAFLD/MASLD is becoming increasingly prominent. This trend mirrors patterns observed across Asia, indicating a broader regional health challenge.[41]

The pooled prevalence of HBV infection in Bangladesh at 4.0% represents a declining trend after EPI implementation in 2003.[3] However, without improved birth-dose coverage, an estimated 40,000 new chronic infections may occur annually.[42] Strengthening HBV control through universal birth-dose vaccination, antenatal screening, and antiviral prophylaxis for high-risk mothers is critical.

NAFLD/MASLD prevalence of 25.2% in the general population and 55.1% among those with metabolic diseases represents a substantial and growing burden.[8] Alarmingly, non-obese NAFLD comprising 43.4% of cases highlights the unique "Asian metabolic phenotype."[8] This epidemiological transition signals a growing future burden of cirrhosis, HCC, and cardiovascular comorbidities.

Clinical presentation and disease burden

Patients often present at advanced stages, leading to high rates of decompensation. One-year mortality in decompensated cirrhosis ranges from 40-60%, comparable to international estimates.[29] Antimicrobial resistance in SBP is increasing, with third-generation cephalosporin resistance reaching 22.4% in some centers, necessitating revision of empiric antibiotic protocols.[31] HCC presents a significant challenge, with 82% of cases developing in patients with cirrhosis and 70-80% presenting at advanced stages precluding curative therapy. The median overall survival of 17.3 months in South Asia underscores the aggressive nature of the disease and limitations of current management.[10]

Health system and policy implications

Bangladesh faces substantial gaps in liver disease management. Major deficiencies include: inadequate viral hepatitis screening and treatment coverage; absence of NAFLD/MASLD prevention programs; limited endoscopy services outside Dhaka; antimicrobial resistance in SBP without updated protocols; inconsistent HCC surveillance; and extremely limited liver transplantation capacity.

Policy interventions should prioritize

Closing HBV vaccination and screening gaps, particularly birth-dose coverage. Integrating NAFLD/MASLD prevention and management into primary care NCD programs

Expanding HCV case-finding and treatment. Ensuring guideline-based management of cirrhosis complications. Establishing national registries to monitor disease burden and guide resource allocation

Strengths

This review provides the first comprehensive synthesis of cirrhosis epidemiology in Bangladesh, integrating data on etiology, complications, and health system gaps. Rigorous methodology included comprehensive database searches, dual independent screening, and systematic quality assessment. Inclusion of both published and grey literature enhanced representativeness.

Limitations

The predominance of single-center hospital-based studies from Dhaka limits generalizability to other regions. Rural populations, where 70% of Bangladeshis reside, are significantly underrepresented. Lack of national registries and standardized case definitions complicated data synthesis. Only 29% of included studies were low risk of bias. The cross-sectional nature of most studies precludes assessment of temporal trends. Publication bias may favor positive findings. Some outcomes (e.g., ALD burden, HRS incidence) are likely underreported.

Several research gaps require attention

Population-based epidemiological studies in rural and community settings; longitudinal cohort studies to track disease progression; implementation science research to understand barriers and facilitators; health economic analyses to inform resource allocation; operational research for context-appropriate interventions; and establishment of national registries for disease surveillance.

CONCLUSION

Bangladesh is experiencing a dual burden of viral and metabolic liver diseases, with NAFLD/MASLD emerging as a major public health concern alongside persistent viral hepatitis. Significant gaps exist in prevention, early detection, and management across the care continuum. Without urgent intervention, the rising tide of NAFLD/MASLD and persistent viral hepatitis could overwhelm health systems. Coordinated public health action, including universal HBV birth-dose vaccination, HCV micro-elimination programs, integrated NAFLD/NCD prevention, improved access to evidence-based cirrhosis care, and establishment of national surveillance systems, is critical to reduce morbidity and mortality from cirrhosis in Bangladesh.

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