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MISSED OPPORTUNITIES FOR CURE: CLINICAL PROFILE AND ABSENCE OF CURATIVE ANTIVIRAL THERAPY AMONG HOSPITALISED PATIENTS WITH CHRONIC HEPATITIS C IN PAKISTAN

Mariya Sadiya[1], Farwa Shaheen[2], Haider Ali[3], Syed Nadeem Ul Hassan Mohani[4], Syed Asim Shah[*5]

[1]*Department of Pharmaceutical Sciences, The Superior University, Lahore, Pakistan*
[2]*Evercare hospital Lahore, Pakistan*
[3]*Department of Pharmacy University of Veterinary & Animal Sciences Lahore, Pakistan*
[4]*Department of Pharmacy, Iqra University Chak Shahzad Campus Islamabad, Pakistan*
[*5]*Department of Pharmacy, Sarhad University of Science and Information Technology Islamabad Campus, Pakistan*

[1]drmariya88@gmail.com, [2]farwa.shaheen900@gmail.com, [3]haider231ksa@gmail.com, [4]nadeem.fls@suit.edu.pk, [*5]syedasimshah10@gmail.com

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Corresponding Author: *
Syed Asim Shah

Abstract

Background: *Direct-acting antivirals (DAAs) cure more than 95% of hepatitis C virus (HCV) infections, yet only about one-fifth of infected people worldwide have been treated. Pakistan carries the largest national HCV burden, and whether hospitalised patients are reached by curative therapy is a critical question for elimination.*

Objective: *To describe the clinical and biochemical profile of patients hospitalised with chronic hepatitis C at a tertiary-care hospital in Pakistan and to determine the proportion receiving curative antiviral therapy.*

Methods: *A cross-sectional, records-based study of 20 consecutive adults with confirmed chronic HCV admitted to a gastroenterology ward over 45 days. Presenting features, comorbidities, laboratory values and all prescribed medicines were recorded. The primary outcome was the proportion receiving a DAA. Proportions are reported with 95% confidence intervals (CIs).*

Results: *The cohort (11 men, 9 women; most aged 51–60 years) presented predominantly with complications of decompensated cirrhosis: vomiting, abdominal pain, ascites and features of hepatic encephalopathy. Management was supportive—lactulose, rifaximin, spironolactone with furosemide and empirical third-generation cephalosporins—and one patient with hepatocellular carcinoma received sorafenib. Alanine aminotransferase was elevated in all patients measured (range 88–175 U/L), hyponatraemia (<135 mmol/L) was present in 9 of 14 (64%) and thrombocytopenia in 7 of 17 (41%). No patient (0/20; 0%, 95% CI 0.0–16.1) was receiving or commenced on a DAA during admission.*

Conclusion: *Patients reached hospital only after progression to decompensated disease, and none received curative antiviral therapy—an avoidable late presentation that epitomises the treatment gap Pakistan must close to meet the World Health Organization's 2030 elimination target. Earlier screening, linkage to care and integration of DAA therapy into hospital pathways are urgently needed.*

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INTRODUCTION

Pan-genotypic direct-acting antivirals (DAAs) have transformed hepatitis C from a chronic, progressive infection into a curable disease, with a short oral course achieving cure in more than 95% of patients.[1] On this basis the World Health Assembly resolved to eliminate viral hepatitis as a public health threat by 2030, targeting a 90% reduction in new chronic HCV infections, a 65% reduction in HCV mortality, diagnosis of 90% of those infected and treatment of 80% of eligible patients.[1,2] Yet access remains the binding constraint: only about one-fifth of people with hepatitis C have been treated since curative therapy became available, and in 2024 the infection still caused an estimated 239,000 deaths, chiefly from cirrhosis and hepatocellular carcinoma.[1,3]

Nowhere is this gap more consequential than in Pakistan, which carries the world's largest national HCV burden—around ten million people living with the infection—and is among the ten countries responsible for most HCV deaths globally.[3,4] Only a quarter to a third of infected Pakistanis are aware of their status.[4,5] In response, the government launched the Prime Minister's National Programme for the Elimination of Hepatitis C in 2024, aiming to test a large share of the population and treat millions before 2027.[4,5] The success of this programme depends on reaching patients before irreversible liver damage occurs and on ensuring that those who do reach health facilities are linked to curative therapy.[6]

The treatment status of patients admitted to hospital with chronic HCV is therefore a revealing but rarely reported indicator. This study describes the clinical and biochemical profile of such patients at a tertiary-care hospital in Pakistan and addresses a simple, elimination-relevant question: how many were receiving curative antiviral therapy?

METHODS

Design, setting and participants

This single-centre, cross-sectional, records-based observational study followed the STROBE statement. Over a 45-day period in 2023, 20 consecutive adults admitted with confirmed chronic hepatitis C to the gastroenterology ward of a tertiary-care teaching hospital in Pakistan were reviewed. Patients without confirmed hepatitis C were excluded.

Data collection and outcomes

A structured proforma captured demographic details, presenting complaints, comorbidities, laboratory investigations and all prescribed medicines (generic name, dose, frequency, route and duration). The primary outcome was the proportion of patients receiving a DAA during admission. Secondary descriptors were the pattern of presenting complications, the classes of supportive medication used, and the biochemical and haematological profile.

Statistical analysis

Categorical variables are summarised as frequencies and percentages, with 95% CIs for key proportions calculated by the Wilson score method. Laboratory abnormalities were defined against local reference ranges and summarised among patients in whom the test was recorded. No inferential testing was undertaken.

Related publication

This article and a companion paper derive from a single 45-day cohort of 20 patients. To avoid redundant publication, the two papers address distinct research questions and report separate primary outcomes; baseline demographic data are shared. The present paper addresses the clinical profile and the absence of curative antiviral therapy; the companion paper examines antibiotic utilisation and drug-related problems.

RESULTS

The 20 patients (11 men, 9 women) were predominantly middle-aged to elderly, with most aged 51–60 years (Table 1). Presenting features were those of advanced, decompensated liver disease (Table 2): vomiting, abdominal pain and distension, loss of appetite, fever and, in several patients, shortness of breath and features suggestive of hepatic encephalopathy. Diabetes mellitus and hypertension were the commonest comorbidities, and one patient had hepatocellular carcinoma.

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Table 1. Demographic characteristics of the cohort (n = 20).

Characteristic	Category	n	%
Sex	Male	11	55.0
	Female	9	45.0
Age group (years)	21–30	2	10.0
	31–40	3	15.0
	41–50	3	15.0
	51–60	7	35.0
	61–70	5	25.0

Table 2. Predominant presenting features and management categories (n = 20).

Domain	Observation
Common presenting complaints	Vomiting, abdominal pain/distension, loss of appetite, fever, shortness of breath
Complications of decompensation	Ascites, features of hepatic encephalopathy, gastrointestinal bleeding (selected patients)
Encephalopathy management	Lactulose and rifaximin
Ascites management	Spironolactone plus furosemide
Empirical antibiotics	Third-generation cephalosporins (ceftriaxone, cefoperazone–sulbactam)
Hepatocellular carcinoma	Sorafenib (1 patient)
Direct-acting antiviral therapy	None (0 patients)

DAA, direct-acting antiviral. Management was supportive and directed at complications; no curative antiviral therapy was prescribed.

The biochemical and haematological profile reinforced the picture of advanced liver disease (Table 3). Alanine aminotransferase was elevated above the upper reference limit in every patient in whom it was measured (range 88–175 U/L). Hyponatraemia, a marker of advanced cirrhosis and poor prognosis, was present in 9 of 14 patients measured (64%), and thrombocytopenia—reflecting portal hypertension and hypersplenism—in 7 of 17 (41%). Anaemia was present in 9 of 18 patients (50%), whereas serum creatinine was normal in all 17 patients measured, indicating that overt hepatorenal dysfunction was not established.

Table 3. Selected laboratory abnormalities among patients in whom each test was measured.

Parameter	Definition of abnormality	Abnormal / measured	%
Alanine aminotransferase	> 40 U/L	17 / 17	100
Serum sodium	< 135 mmol/L (hyponatraemia)	9 / 14	64
Platelet count	< 150 × 10^9/L (thrombocytopenia)	7 / 17	41
Haemoglobin	< 12 g/dL (anaemia)	9 / 18	50
Serum creatinine	> 1.3 mg/dL	0 / 17	0

Denominators vary because not every test was recorded for every patient. Observed ranges: alanine aminotransferase 88–175 U/L; haemoglobin 7.3–14.5 g/dL.

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None of the 20 patients (0%, 95% CI 0.0–16.1) was receiving, or was started on, a DAA during admission, despite all having confirmed chronic hepatitis C. Every regimen was directed at the complications of advanced liver disease rather than at eradicating the underlying infection.

DISCUSSION

In this study, none of 20 patients admitted to a tertiary-care hospital in Pakistan with chronic hepatitis C was receiving curative antiviral therapy, and all were being managed for the complications of decompensated cirrhosis. These patients embody the treatment gap that stands between Pakistan and the World Health Organization's 2030 elimination target.

The clinical and biochemical profile—universal transaminase elevation, frequent hyponatraemia and thrombocytopenia, ascites and encephalopathy—indicates that these patients presented late, only once portal hypertension and hepatic decompensation had developed.[4–6] At that stage, supportive care with lactulose and rifaximin for encephalopathy,[7] dual diuretics for ascites,[8,9] and empirical third-generation cephalosporins for suspected infection is appropriate and guideline-concordant. The problem is not what was prescribed but what was missing. DAAs cure more than 95% of infections and, even in compensated cirrhosis, reduce the risks of decompensation, hepatocellular carcinoma and death;[1,10] their complete absence from these regimens represents a missed opportunity at the point of maximal contact with the health system.

Several factors plausibly underlie this gap. Only a quarter to a third of infected Pakistanis are aware of their diagnosis, so many present for the first time with advanced disease; DAAs have historically been delivered through vertical programmes and specialist clinics rather than integrated into inpatient hepatology pathways; and decompensated cirrhosis itself complicates regimen selection and timing.[4–6] Yet the admission of a patient with chronic HCV is precisely the moment to test, stage and link to—or initiate—curative therapy. Egypt, which moved from one of the world's highest HCV burdens to near-elimination through mass screening and treatment, shows what is achievable when diagnosis is coupled to immediate treatment.[4]

The findings carry a concrete policy and practice message that aligns with the Prime Minister's National Programme for the Elimination of Hepatitis C.[4,5] Hospital admission should trigger a structured pathway: confirm viraemia, assess fibrosis and comorbidity, and either initiate a pan-genotypic DAA regimen or ensure rapid, documented linkage to a treatment centre before discharge. Embedding this pathway, supported by clinical pharmacists and simple checklists, would convert episodic, complication-driven admissions into opportunities for cure and directly advance the national elimination effort.

Strengths and limitations

The study captures a simple, elimination-relevant indicator—curative treatment coverage at the point of admission—that is rarely reported for inpatients. Its limitations are the small, single-centre sample (n = 20) over a short period, which precludes generalisation and yields a wide confidence interval; the records-based design, which may under-capture outpatient DAA use initiated elsewhere; and the absence of fibrosis staging, genotype and follow-up data. Larger, multicentre studies measuring DAA coverage and linkage to care among admitted HCV patients would strengthen and extend these observations.

CONCLUSION

Patients admitted with chronic hepatitis C to this tertiary-care hospital presented late, with decompensated cirrhosis and its complications, and none received curative antiviral therapy. In the country with the world's largest hepatitis C burden, this avoidable treatment gap at the point of hospital contact undermines elimination efforts. Systematically coupling admission to diagnosis, staging and DAA therapy—or documented linkage to care—is an achievable, high-impact intervention.

RECOMMENDATIONS

- **Clinical:** for every admitted patient with chronic hepatitis C, confirm viraemia, stage fibrosis, and initiate or arrange documented linkage to pan-genotypic DAA therapy before discharge.

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- **Hospital:** implement an inpatient HCV care pathway with a discharge checklist ensuring treatment initiation or referral.
- **Policy:** integrate DAA access into hospital services under the Prime Minister's National Programme, rather than relying solely on vertical clinics.
- **Public health:** strengthen earlier community screening and linkage to care to reduce late, decompensated presentations.
- **Research:** measure DAA treatment coverage and linkage to care among admitted HCV patients in multicentre studies.

DECLARATIONS

Ethics approval and consent to participate. The study was approved by the institutional ethical review committee of the participating hospital. Individual consent was waived for this retrospective record review, and all data were anonymised.

Consent for publication. Not applicable.

Availability of data and materials. The dataset is available from the corresponding author on reasonable request.

Competing interests. The authors declare that they have no competing interests.

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REFERENCES

World Health Organization. Hepatitis C [fact sheet]. Geneva: WHO; 2025. Available from: https://www.who.int/news-room/fact-sheets/detail/hepatitis-c

World Health Organization. Global hepatitis report 2024. Geneva: WHO; 2024. Available from: https://www.who.int/publications/i/item/9789240091672

World Health Organization. Efforts to eliminate hepatitis deliver gains but more action needed to meet 2030 targets [news release]. Geneva: WHO; 28 April 2026.

World Health Organization Regional Office for the Eastern Mediterranean. Pakistan, WHO launch Prime Minister's National Programme for the Elimination of Hepatitis C. Cairo: WHO EMRO; 2026. Available from: https://www.emro.who.int/pak/pakistan-news/

World Health Organization Regional Office for the Eastern Mediterranean. WHO urges action to detect and treat over 13.8 million people infected with hepatitis B and C in Pakistan. Cairo: WHO EMRO; 28 July 2025.

Asim N, Hu W, Qiao L, Khan UA, Nisa ZU. Stakeholder perspectives and the challenges in implementing hepatitis C elimination policy in Pakistan. Front Public Health. 2025;13:1540689. doi:10.3389/fpubh.2025.1540689

Vilstrup H, Amodio P, Bajaj J, Cordoba J, Ferenci P, Mullen KD, et al. Hepatic encephalopathy in chronic liver disease: 2014 practice guideline by the American Association for the Study of Liver Diseases and the European Association for the Study of the Liver. Hepatology. 2014;60(2):715–735. doi:10.1002/hep.27210

European Association for the Study of the Liver. EASL clinical practice guidelines on the management of ascites, spontaneous bacterial peritonitis, and hepatorenal syndrome in cirrhosis. J Hepatol. 2010;53(3):397–417. doi:10.1016/j.jhep.2010.05.004

Biggins SW, Angeli P, Garcia-Tsao G, Ginès P, Ling SC, Nadim MK, et al. Diagnosis, evaluation, and management of ascites, spontaneous bacterial peritonitis and hepatorenal syndrome: 2021 practice guidance by the American Association for the Study of Liver Diseases. Hepatology. 2021;74(2):1014–1048. doi:10.1002/hep.31884

Kohli A, Shaffer A, Sherman A, Kottilil S. Treatment of hepatitis C: a systematic review. JAMA. 2014;312(6):631–640. doi:10.1001/jama.2014.7085