

Original Research Article

HIGH SEROPREVALENCE OF HEPATITIS C VIRUS AMONG HOSPITALIZED PATIENTS IN WESTERN UTTAR PRADESH: A RETROSPECTIVE OBSERVATIONAL STUDY

Prachee Singh¹¹Associate Professor, Department of Microbiology, Ajay Sangaal Institute of Medical Sciences and Research, Shamli, UP, India

Received : 11/05/2026
 Received in revised form : 22/06/2026
 Accepted : 07/07/2026

Corresponding Author:

Dr. Prachee Singh,
 Associate Professor, Department of
 Microbiology, Ajay Sangaal Institute of
 Medical Sciences and Research,
 Shamli, UP, India.
 Email: pracheesingh123@gmail.com

DOI: 10.70034/ijmedph.2026.3.91

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

Int J Med Pub Health
 2026; 16 (3); 556-560

ABSTRACT

Background: Hepatitis C virus (HCV) infection remains a major global health concern and a leading cause of chronic liver disease. Hospital-based studies are important for identifying high-risk populations and guiding screening strategies. The objective is to determine the seroprevalence and demographic distribution of HCV infection among hospitalized patients in a tertiary care hospital in Western Uttar Pradesh.

Materials and Methods: A retrospective observational study was conducted over three months in the Department of Microbiology. A total of 629 hospitalized patients tested for anti-HCV antibodies were included. Serum samples were analyzed using a third-generation enzyme-linked immunosorbent assay (ELISA). Data were evaluated for age, sex, and department-wise distribution. Statistical analysis was performed using the chi-square test, with $p < 0.05$ considered statistically significant.

Results: Out of 629 patients, 80 were seropositive, yielding an overall prevalence of 12.7%. Positivity was higher among males (14.4%) compared to females (11.9%). The highest prevalence was observed in the 41–60 years age group (16.7%). Department-wise analysis showed higher seropositivity in General Surgery (14.9%) and General Medicine (13.8%).

Conclusion: The study demonstrates a relatively high seroprevalence of HCV infection among hospitalized patients. The findings highlight the need for routine screening and strengthening of infection control practices in hospital settings to reduce transmission and disease burden.

Keywords: Hepatitis C virus, Seroprevalence, Hospitalized patients, ELISA, Tertiary care.

INTRODUCTION

Hepatitis C remains a significant contributor to global liver-related morbidity and mortality. It is a leading cause of chronic liver disease, cirrhosis, and hepatocellular carcinoma.^[1-3] Despite progress in antiviral treatments, the worldwide burden of HCV remains significant.^[4,5] According to the World Health Organization (WHO), about 50 million people are living with chronic HCV infection globally, with around 1.0 million new cases each year, emphasizing its ongoing public health importance.^[6] Additionally, while highly effective direct-acting antiviral therapies can cure over 95% of cases, many regions still face limited access to diagnosis and treatment.^[6]

India contributes a considerable share to the global burden of HCV infection, with prevalence in the general population ranging between 0.5% and 1.5%, corresponding to approximately 6–12 million individuals living with chronic infection.^[7-10] This burden is not uniformly distributed, and significant regional variability has been documented across the country due to differences in healthcare practices, socioeconomic conditions, and exposure to risk factors.^[11]

In North India, the prevalence of HCV infection has been reported to range between 0.9% and 2.0% in the general population, with higher rates observed among high-risk groups.^[12,13] Studies from northern states, including Uttar Pradesh and neighboring regions,

indicate moderate endemicity with localized clusters of increased prevalence.^[12,13] Additionally, the overall burden of liver disease in India, to which HCV contributes significantly, further underscores the importance of region-specific epidemiological assessment.^[14]

In Uttar Pradesh, the prevalence of HCV infection is estimated to be approximately 1% in the general population, while hospital-based studies from Western Uttar Pradesh have reported higher seroprevalence ranging between 1.5% and 2.0%, reflecting increased burden among clinically selected populations.

Hospital-based studies provide crucial insights into the epidemiology of HCV infection, particularly among high-risk populations such as hospitalized patients who are more likely to be exposed to invasive procedures, blood transfusions, and nosocomial transmission. Such settings often reveal a higher prevalence compared to community-based studies and help in identifying hidden disease burden. However, district-level data from Western Uttar Pradesh, including Shamli, remain scarce. Understanding the seroprevalence of HCV infection among hospitalized patients in this region is essential for guiding screening strategies and strengthening infection control practices.

Therefore, the present study was undertaken to determine the seroprevalence of hepatitis C virus infection among hospitalized patients in a tertiary care hospital in Western Uttar Pradesh.

MATERIALS AND METHODS

Study Design and Setting: This retrospective observational study was conducted in the Department of Microbiology of a tertiary care hospital in Western Uttar Pradesh over a period of three months.

Study Population: A total of 629 hospitalized (IPD) patients tested for anti-HCV antibodies were included. Patients were from multiple departments, including General Medicine, General Surgery, Obstetrics & Gynecology, Orthopedics, and other specialties.

Inclusion Criteria

Hospitalized patients of all age groups and both sexes who were tested for anti-HCV antibodies.

Exclusion Criteria

Patients with incomplete data, repeat samples, and OPD patients were excluded.

Laboratory Methods: Serum samples were tested using a third-generation ELISA for the detection of anti-HCV antibody

es, following standard protocols.

Statistical Analysis: Data were analyzed using appropriate statistical software. Results were expressed as frequencies and percentages. Associations between variables were assessed using the chi-square test. A p-value < 0.05 was considered statistically significant.

RESULTS

[Table 1] depicts the overall seroprevalence of HCV among hospitalized patients. Out of 629 patients, 80 were found to be positive, giving an overall seroprevalence of 12.7%. This relatively high prevalence highlights a substantial burden of HCV infection in the hospitalized population, which is considerably higher than community-based estimates and reflects the increased risk profile of inpatients.

[Table 2] shows the sex-wise distribution of HCV infection. Although female patients constituted a larger proportion of the study population, the positivity rate was higher among males (14.4%) compared to females (11.9%). This suggests that male patients may have relatively higher exposure to risk factors associated with HCV transmission, despite lower absolute numbers.

[Table 3] presents the age-wise distribution of HCV seropositivity. The highest seroprevalence was observed in the 41–60 years age group (16.7%), followed by patients aged >60 years (14.0%). The 21–40 years group showed lower positivity (9.9%), while no positive cases were detected in patients below 20 years of age. This trend indicates an increase in seroprevalence with advancing age, likely due to cumulative exposure to risk factors over time. [Table 4] illustrates the department-wise distribution of HCV infection. The highest seropositivity was observed in General Surgery (14.9%), followed by General Medicine (13.8%). The Obstetrics and Gynecology department showed a seroprevalence of 10.3%, indicating a moderate burden among female inpatients. Lower positivity was observed in Orthopedics (8.2%), while the “Others” category showed a relatively higher proportion (16.1%), possibly due to a smaller sample size.

Overall, the findings demonstrate that HCV seroprevalence is higher among hospitalized patients, with variation across age groups, sex, and clinical departments, suggesting the influence of healthcare-associated exposures and underlying comorbid conditions. These findings emphasize the importance of targeted screening in high-risk hospital departments.

Table 1: Overall HCV Seroprevalence (IPD Patients)

Result	Number (n)	Percentage (%)
Positive	80	12.7%
Negative	549	87.3%
Total	629	100%

Table 2: Sex-wise Distribution (IPD Patients)

Sex	Positive n (%)	Negative n (%)	Total
Female	50 (11.9%)	370 (88.1%)	420
Male	30 (14.4%)	179 (85.6%)	209
Total	80 (12.7%)	549 (87.3%)	629

Table 3: Age-wise Distribution (IPD Patients)

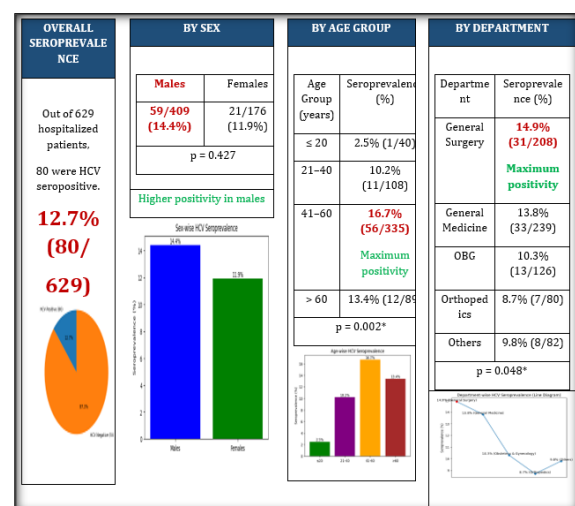
Age Group (Years)	Positive n (%)	Negative n (%)	Total
<20	0 (0.0%)	40 (100%)	40
21–40	21 (9.9%)	191 (90.1%)	212
41–60	38 (16.7%)	189 (83.3%)	227
>60	21 (14.0%)	129 (86.0%)	150
Total	80 (12.7%)	549 (87.3%)	629

Table 4: Department-wise Distribution (IPD Patients)

Department	Positive n (%)	Negative n (%)	Total
General Medicine	34 (13.8%)	212 (86.2%)	246
General Surgery	20 (14.9%)	114 (85.1%)	134
Obstetrics & Gynecology	15 (10.3%)	130 (89.7%)	145
Orthopedics	6 (8.2%)	67 (91.8%)	73
Others*	5 (16.1%)	26 (83.9%)	31
Total	80 (12.7%)	549 (87.3%)	629

*Others include Ophthalmology, Cardiology, ENT, Urology, Emergency, and miscellaneous departments.

Key Findings: High Seroprevalence of Hepatitis C Virus Among Hospitalized Patients in Western Uttar Pradesh: A Retrospective Observational Study.



Key Implication

- A high burden of HCV infection (12.7%) was observed among hospitalized patients in this tertiary care setting.
- Males and middle-aged patients (41–60 years) showed higher seropositivity.
- Departments with frequent invasive procedures had higher prevalence.
- Findings highlight the need for routine screening, strict infection control practices, and early diagnosis to reduce transmission and disease burden.

* Statistically significant ($p < 0.05$) p values calculated using Chi-square test

DISCUSSION

The observed prevalence is substantially higher than commonly reported hospital-based estimates in India,

suggesting a potentially increased burden in this region.

The present study demonstrated an overall HCV seroprevalence of 12.7% among hospitalized patients. The observed prevalence indicates a considerable disease burden in the inpatient population. Hospital-based studies are known to show higher prevalence due to the inclusion of clinically suspected and high-risk individuals.^[15-18]

In comparison, a study by Chakravarti et al. also reported significant HCV burden in hospital-based populations in India.^[15] Similarly, Sharma et al. identified hospitalization and invasive procedures as major contributors to HCV transmission in tertiary care settings.^[16] Another study by Jain RK et al. also reported lower seropositivity, supporting regional variability.^[17] The comparatively higher prevalence in the present study may be attributed to differences in patient selection, referral bias, and regional epidemiological patterns.

With regard to sex-wise distribution, the present study showed a higher positivity rate among males despite a larger female study population. This finding is consistent with studies conducted among high-risk groups such as hemodialysis patients and healthcare workers, where male predominance has been observed.^[19,20] These differences may be explained by occupational exposure, behavioral factors, and differential healthcare utilization.

Age-wise analysis revealed that the highest seroprevalence was observed in the 41–60 years age group, followed by older age groups. This is in agreement with findings reported by Trickey et al and Shukla et al., who demonstrated increasing prevalence with advancing age due to cumulative exposure to risk factors.^[21,22] The absence of positivity in younger age groups in the present study further supports this trend.

Department-wise distribution in the present study showed higher seropositivity in General Surgery and

General Medicine, followed by the combined Obstetrics and Gynecology department. Similar trends have been reported in hospital-based studies, including those by Bhattacharya et al., where increased prevalence was observed in patients exposed to invasive procedures and hospital interventions.^[18] These findings emphasize the role of healthcare-associated transmission and procedural exposure.

The relatively higher positivity observed in the “Others” category, although based on a smaller sample size, further highlights the widespread distribution of HCV infection across various specialties. Studies in high-risk populations such as dialysis patients and healthcare workers also support increased prevalence due to repeated healthcare exposure.^[19,20]

Globally, studies have highlighted the substantial burden of HCV infection and the importance of targeted screening strategies.^[23-25] The findings of the present study are consistent with these observations and reinforce the need for strengthened screening and infection control practices in hospital settings.

CONCLUSION

The present study demonstrates a high seroprevalence of hepatitis C virus infection (12.7%) among hospitalized patients in a tertiary care setting, exceeding commonly reported estimates in similar populations. The higher prevalence observed in middle-aged individuals and in departments such as General Surgery and General Medicine suggests the role of cumulative exposure and healthcare-associated risk factors.

These findings highlight the importance of targeted screening, strengthening infection control practices, and ensuring safe clinical procedures. Early diagnosis and appropriate management are essential to reduce disease burden. Further multicentric studies are warranted to better understand regional epidemiology.

REFERENCES

1. Polaris Observatory HCV Collaborators. Global prevalence and genotype distribution of hepatitis C virus infection in 2015: a modelling study. *Lancet Gastroenterol Hepatol*. 2017 Mar;2(3):161-176. doi: 10.1016/S2468-1253(16)30181-9. Epub 2016 Dec 16. PMID: 28404132.
2. Spearman CW, Dusheiko GM, Hellard M, et al . Hepatitis C. *Lancet*. 2019 Oct 19;394(10207):1451-1466. doi: 10.1016/S0140-6736(19)32320-7. PMID: 31631857.
3. Mohd Hanafiah K, Groeger J, Flaxman AD, et al . Global epidemiology of hepatitis C virus infection: new estimates of age-specific antibody to HCV seroprevalence. *Hepatology*. 2013 Apr;57(4):1333-42. doi: 10.1002/hep.26141. Epub 2013 Feb 4. PMID: 23172780.
4. Shepard CW, Finelli L, Alter MJ. Global epidemiology of hepatitis C virus infection. *Lancet Infect Dis*. 2005 Sep;5(9):558-67. doi: 10.1016/S1473-3099(05)70216-4. PMID: 16122679.
5. Tan EY, Danpanichkul P, Yong JN, et al . Global Burden of Disease study. *J Hepatol*. 2025 May;82(5):851-860. doi:

- 10.1016/j.jhep.2024.10.031. Epub 2024 Oct 30. PMID: 39481652.
6. World Health Organization. Hepatitis C fact sheet. Geneva: WHO; 2024. Available from: <https://www.who.int/news-room/fact-sheets/detail/hepatitis-c>.25 July 2025
7. Goel A, Seguy N, Aggarwal R. Burden of hepatitis C virus infection in India: A systematic review and meta-analysis. *J Gastroenterol Hepatol*. 2019 Feb;34(2):321-329. doi: 10.1111/jgh.14466. Epub 2018 Sep 26. PMID: 30176181.
8. Gupta E, Bajpai M, Choudhary A. Hepatitis C virus: Screening, diagnosis, and interpretation of laboratory assays. *Asian J Transfus Sci*. 2014;8(1):19-25. doi:10.4103/0973-6247.126683
9. Anand A, Shalimar. Hepatitis C virus in India: Challenges and Successes. *Clin Liver Dis (Hoboken)*. 2021;18(3):150-154. Published 2021 Jul 22. doi:10.1002/cld.1137
10. Barman B, Roy A, Nune A, et al . Epidemiology, clinical, and laboratory profile of patients with hepatitis C: A prospective, observational study from north-eastern India. *Trop Doct*. 2022 Oct;52(4):484-488. doi: 10.1177/00494755221110636. Epub 2022 Jul 13. PMID: 35833220.
11. Kumar D, Peter RM, Joseph A, et al . Prevalence of viral hepatitis infection in India: A systematic review and meta-analysis. *J Educ Health Promot*. 2023;12:103. Published 2023 Mar 31. doi:10.4103/jehp.jehp_1005_22
12. Sood AK, Manrai M, Thareja S, et al . Epidemiology of hepatitis C virus infection in a tertiary care hospital. *Med J Armed Forces India*. 2020;76(4):443-450. doi:10.1016/j.mjafi.2019.08.003
13. Prakash S, Shukla S, Ramakrishna V, et al . Distribution of hepatitis C genotypes in Uttar Pradesh, India; rare genotype 4 detected. *J Med Virol*. 2018 Dec;90(12):1875-1881. doi: 10.1002/jmv.25277. Epub 2018 Sep 3. PMID: 30085356.
14. Toma D, Anghel L, Patraş D, et al . Hepatitis C Virus: Epidemiological Challenges and Global Strategies for Elimination. *Viruses*. 2025;17(8):1069. Published 2025 Jul 31. doi:10.3390/v17081069
15. Chakravarti A, Dogra G, Verma V, et al . Distribution pattern of HCV genotypes & its association with viral load. *Indian J Med Res*. 2011;133(3):326-331.
16. Sharma P, Satija M, Chaudhary A, et al . Epidemiological correlates of hepatitis C infection- A case control analysis from a tertiary care hospital. *J Family Med Prim Care*. 2022;11(5):2099-2105. doi:10.4103/jfmpc.jfmpc_1965_21
17. Jain RK, Shrivastava R, Jain SK, et al . Seropositivity and coinfection of hepatitis B and hepatitis C viruses in Central India: A hospital-based study. *J Family Med Prim Care*. 2024;13(10):4413-4418. doi:10.4103/jfmpc.jfmpc_202_24
18. Bhattacharya S, Badrinath S, Hamide A, et al . Seroprevalence of Hepatitis C virus in a hospital based general population in south India. *Indian J Med Microbiol*. 2003 Jan-Mar;21(1):43-5. PMID: 17642973.
19. Madhavan A, Sachu A, Balakrishnan AK, et al . Prevalence of hepatitis C among haemodialysis patients in a tertiary care hospital in south India. *Iran J Microbiol*. 2020;12(6):644-649. doi:10.18502/ijm.v12i6.5041. PMID: PMC7884274
20. Jindal N, Jindal M, Jilani N, et al . Seroprevalence of hepatitis C virus (HCV) in health care workers of a tertiary care centre in New Delhi. *The Indian Journal of Medical Research*. 2006 Feb;123(2):179-180. PMID: 16575118.
21. Trickey A, Fraser H, Lim AG, et al . The contribution of injection drug use to hepatitis C virus transmission globally, regionally, and at country level: a modelling study. *Lancet Gastroenterol Hepatol*. 2019 Jun;4(6):435-444. doi: 10.1016/S2468-1253(19)30085-8. Epub 2019 Apr 10. Erratum in: *Lancet Gastroenterol Hepatol*. 2019 Jun;4(6):e5. doi: 10.1016/S2468-1253(19)30126-8. PMID: 30981685; PMID: PMC6698583.
22. Shukla L, Shivaprakash P, Kumar MS. HIV, hepatitis B & C in people who inject drugs in India: A systematic review of regional heterogeneity & overview of opioid substitution treatment. *Indian J Med Res*. 2023 Nov 1;158(5&6):522-534. doi: 10.4103/ijmr.ijmr_1930_23. Epub 2024 Jan 24. PMID: 38265946; PMID: PMC10878493.
23. Saraswat V, Norris S, de Knegt RJ, et al . Historical epidemiology of hepatitis C virus (HCV) in select countries -

- volume 2. J Viral Hepat. 2015 Jan;22 Suppl 1:6-25. doi: 10.1111/jvh.12350. PMID: 25560839.
24. Alter MJ, Kuhnert WL, Finelli L; Centers for Disease Control and Prevention. Guidelines for laboratory testing and result reporting of antibody to hepatitis C virus. Centers for Disease Control and Prevention. MMWR Recomm Rep. 2003 Feb 7;52(RR-3):1-13, 15; quiz CE1-4. PMID: 12585742.
 25. Stanaway JD, Flaxman AD, Naghavi M, et al. The global burden of viral hepatitis from 1990 to 2013: findings from the Global Burden of Disease Study 2013. Lancet. 2016 Sep 10;388(10049):1081-1088. doi: 10.1016/S0140-6736(16)30579-7. Epub 2016 Jul 7. PMID: 27394647; PMCID: PMC5100695.