

# Current Profile of Hepatitis C in Tripura, India

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## Abstract

**Introduction:** Viral hepatitis is one of the common causes of chronic liver disease. Hepatitis C is the second most important cause of chronic viral hepatitis. Globally, an estimated 71 million people have chronic hepatitis C infection. In 2015, there were 1.75 million new hepatitis C virus (HCV) infections. Approximately 399,000 people die each year due to HCV-related cirrhosis and hepatocellular carcinoma. Highest numbers of infections are noted in Egypt. South East Asian region countries are also having high prevalence. The prevalence in India is around 1%. In Tripura, blood bank-based study shows prevalence around 0.1%. Higher prevalence was seen in patient on maintenance hemodialysis.

**Objectives:** The study was designed to determine. (1) Mode of transmission of hepatitis C in Tripura, (2) To evaluate genotypic pattern of hepatitis C infection in Tripura, (3) To evaluate coinfection with human immune deficiency virus (HIV)/hepatitis B virus (HBV).

**Materials and Methods:** It was a cross-sectional study done on 60 consecutive hepatitis C patients attended the liver clinic of Hepatitis Foundation of Tripura between January 2018 and December 2018.

**Results:** The study reveals that in this group, 65% hepatitis C patients were males and 35% were females and 63.3% patients are from rural areas whereas 36.7% patients are from urban areas. Study shows that there is shift of age among hepatitis C patients from older to the younger group. It was observed that 5% of hepatitis C patients had coinfection with HIV infection but no coinfection with HBV. Regarding mode transmission of hepatitis C, 30% are through blood transmission, 20% through drug abuse, 16.7% patients through sexual route, 11.6% patients through dialysis, 1.7% prenatal transmission, and 20% remain unknown. Genotype 3 was 75% (3a was found in 55% and 20% were genotype 3b,) and genotype 1 was 25% (21.7% genotype 1a and 3.3% were genotype 1b). In the study group, 18% were in decompensated chronic liver disease.

**Discussion:** The prevalence of HCV infection seems to be increasing among people who inject drugs in Tripura. Male preponderance in this study may be due to more exposure to drugs among males. Higher prevalence of Hepatitis C among the rural people may be due to increase quackery practice in the rural areas.

**Key words:** Hepatitis B virus, Hepatitis C virus infection, Hepatocellular carcinoma, Human immune deficiency virus, Maintenance hemodialysis, People who inject drugs

## INTRODUCTION

The liver was considered as “seat of soul” in Greek mythology. Roman anatomist “Galen” first considered the liver as the principal organ of human body. Understanding of liver diseases has undergone extensive changes, and today, we know that “hepatitis viruses” are the most common cause of liver disease. Major hepatotropic

viruses are of six types, hepatitis A, B, C, D, E, and G. Hepatitis A and E are transmitted by the fecal–oral route, while others are blood borne. Hepatitis C was discovered by Houghton in 1989.<sup>[1]</sup> No vaccination for hepatitis C has been discovered till date. However, advancement in treatment modality of hepatitis C has been magnificent, from interferon-based therapy, to direct-acting antiviral agents leading to cure of disease.

Hepatitis C virus (HCV) accounts for approximately 15–20% cases of acute hepatitis.<sup>[2]</sup> After acute infection, around 70–85% of HCV patients will develop chronic infection.<sup>[3]</sup> Globally, an estimated 71 million people have chronic hepatitis C infection. In 2015, there were 1.75 million new HCV infections.<sup>[4]</sup> Approximately 399,000 people die each year due to HCV-related cirrhosis

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and HCC.<sup>[5]</sup> Highest numbers of infections are noted in Egypt.<sup>[6]</sup> South East Asian region countries are also having high prevalence. The prevalence in India is around 1%.<sup>[7]</sup> In Tripura, blood bank-based study shows the prevalence around 0.1%. Higher prevalence was seen in patient on maintenance hemodialysis.<sup>[8]</sup>

The prevalence of anti-HCV in the general population in India is approximately 1%, of which 80% have detectable HCV RNA.<sup>[9]</sup> Transmission is by parental routes.

Hepatitis C is a RNA virus comprising six genotypes. Genotype 3 is the most common type in India, followed by genotype 1. Overall, genotypes 1, 2, and 3 are most common in North America and Europe, while genotype 4 is most common in Middle East and Africa. Genotype 5 is seen mostly in South Africa and South East Asia and genotype 6 is mostly seen in South-East Asia.<sup>[10]</sup>

Incubation period of HCV ranges from 15 days to 160 days with a mean of about 50 days. Acute illness is usually asymptomatic and clinically in-apparent. Non-specific symptoms such as nausea and fatigue can be seen in 20–30% cases. Patients with symptomatic acute infection and jaundice have higher chances of spontaneous clearance. Spontaneous loss of HCV RNA from blood occurs with 3 months–4 months in these patients. Progression to chronicity occurs in 70–80%. Approximately 20–30% of those patients will develop cirrhosis over 20–30 years. Once cirrhosis develops, decompensation occurs at the rate of 3% per year. In HCV-associated liver cirrhosis, hepatocellular carcinoma occurs in 4–5% of patients per year.<sup>[11]</sup>

This study was designed to evaluate the pattern of HCV infection in Tripura.

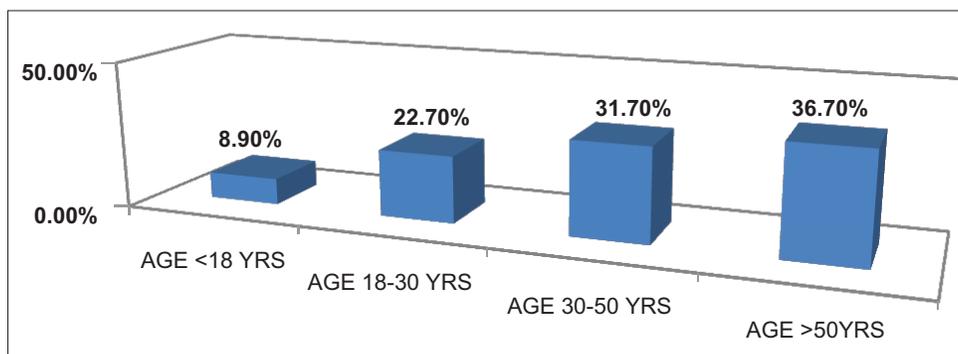


Figure 1: Age-wise distribution of hepatitis C

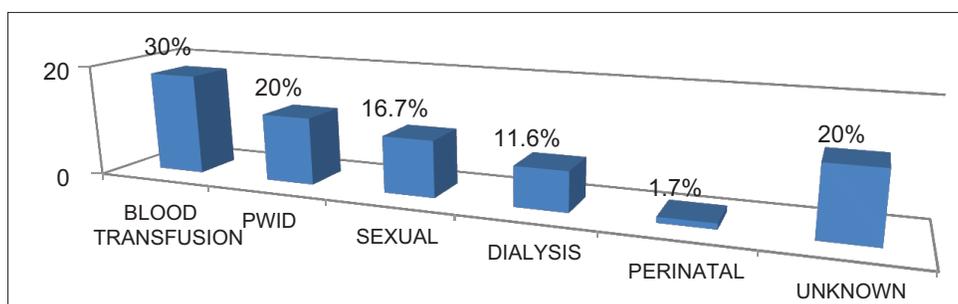


Figure 2: Mode of transmission of hepatitis C

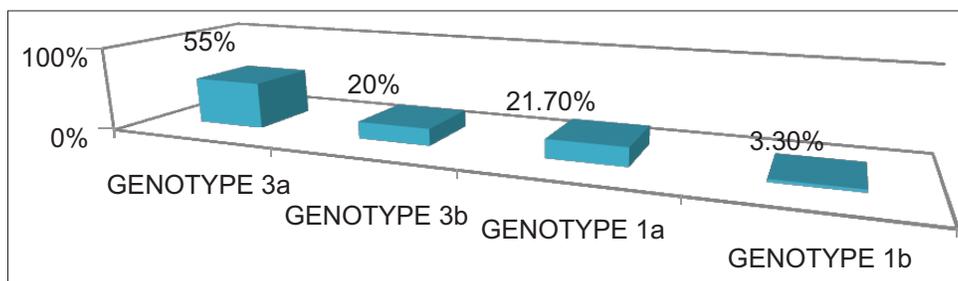


Figure 3: Genotype-wise distribution of hepatitis C in Tripura

## Objectives

1. Mode of transmission of hepatitis C in Tripura
2. To evaluate genotypic pattern of hepatitis C infection in Tripura
3. To evaluate coinfection with human immune deficiency virus (HIV)/hepatitis B virus (HBV).

## MATERIALS AND METHODS

This is a cross-sectional study done on 60 consecutive hepatitis C patients attended the liver clinic of Hepatitis Foundation of Tripura between January 2018 and December 2018. Male preponderance is found in hepatitis C infection.

Liver clinic is one of the premier centers of management of liver disease in Tripura, and most of the hepatitis C patients get treatment from this center. Hence, epidemiological evaluation of these patients represents the hepatitis C disease scenario of Tripura. Accordingly, the study was designed, and data were collected in a pre-designed pro forma. The evaluation includes a history of the patients, particularly mode of transmission of hepatitis C. All patients were clinically evaluated for status of disease particularly decompensation. HCV RNA was evaluated for quantitative status and genotypes. The recorded data has been evaluated statistically.

## RESULTS

The study was done among the first 60 consecutive patients of hepatitis C received at liver clinic of hepatitis foundation of Tripura.

The study reveals that among the patients who received treatment at liver clinic, 65% of them were male and 35% were female. Similarly, on analysis of rural and urban ratio, there was a rural preponderance (63.3%) which is significant.

The age distribution was analyzed in the study group, and it was observed that 8.9% of the patients were below 18 years of age and 22.7% of the patients were at the age group of 18–30 years. Although 36.7% of the patients were above the 60 years of age, 31.7% of patients were between 30 and 50 years of age. It shows that there is a shift of age among hepatitis C patients of the study group from older to the younger age group [Figure 1].

The mode of transmission of hepatitis C was analyzed on the basis of history from the patients and relatives, and it was found that blood transfusion (30%) is probably the most common cause of hepatitis C transmission [Figure 2].

The most astonishing observation was that 20% of the hepatitis C is directly related to the injectable drug abuse people who inject drugs (PWID).

Through in 20% of the patient, the exact mode of transmission could not be determined, but hemodialysis is still probably the cause of hepatitis C among 11.6% of the patients of the study group.

The genotype of hepatitis C was analyzed in all patients, and it was observed that genotype C (75%) is the most common genotype in Tripura. Out of these, genotype 3A was 73% and genotype 3B was 27%. Rests of the hepatitis C patients were genotype 1 (25%). Out of these, 88% were genotype 1A and 12% were genotype 1B [Figure 3].

Coinfection was studied among all the patients of hepatitis C, and it was found that 5% of the hepatitis C patients were also having HIV coinfection, but there was no HCV and HBV coinfection in the study group.

The status of disease was evaluated, and it was found that 18% patients were in a state of decompensation requiring immediate attention.

## DISCUSSION

HCV infection is one of the major global health burdens and its prevalence varies regionally depending on its historical and present risk factors. This study of Tripura represents a comprehensive effort to present in a systematic manner the actual situation of the epidemiology of HCV infection in this Northeast state of India. Studies on HCV prevalence among blood donors, hemodialysis patients were done previously. Study reveals that 10.9% patients were newly infected with hepatitis C during dialysis.<sup>[8]</sup> The average of HCV positivity in 8 years period was 0.109% among the blood donors. HCV seropositivity among voluntary and replacement donors was 0.109%, and 0.11%, respectively.<sup>[9]</sup>

Injecting drug use is the primary risk factor for hepatitis C, accounting for approximately 70% of new infections in 2016 in the United States.<sup>[11]</sup> Globally, there are an estimated 14 million PWID (range: 11.2–22.0 million) who are at risk of HCV infection.<sup>[10]</sup> Previously, HCV infection had affected PWID aged  $\geq 40$  years. However, recent HCV infection outbreaks among networks of PWID have demonstrated a changing demographic pattern of HCV-infection among young PWID (18–35 years), and predominantly males are affected in comparison to females.<sup>[12]</sup> The present study also reveals a male preponderance of hepatitis C infection and more common in younger age.

In this study, blood transmission was the cause of hepatitis C transmission among 30% of the patients, whereas in 20% patients, it was through injecting drugs (PWID). This shift of mode of transmission had been observed in some recent

studies. The WHO updates in 2018 revealed that 60% of patients had mode of transmission through PWID, 10% patients through blood transmission, 15% patients through sexual route, hemodialysis, and prenatal, other is 5% cases, and 10% remain unknown.<sup>[13]</sup> In the present study, almost all PWIDs with HCV infection are below the age of 25 years, and there is significant male preponderance. This may be due to the higher prevalence of PWID among male in Tripura. But Abara *et al.* have demonstrated significant female preponderance in the USA.<sup>[12]</sup> This may be due to the higher prevalence of PWID among male in Tripura.

In Tripura, it was observed that only 5% of HCV patient are having HIV coinfection, whereas the same group (Abara *et al.*) has demonstrated a 52.4% HIV/HCV coinfection.<sup>[12]</sup> This may be due to the comparatively less prevalence of HIV infection and coinfection in Tripura.<sup>[14,15]</sup>

In this study, there was clear rural preponderance which may be due to quackery practice prevailing in the rural community or more addiction to drugs of rural boys residing in city for study purpose. This needs in depth analysis.

The present study reveals higher prevalence of genotype 3 (75%) among the study group. Barman *et al.* in 2018 from North East India have reported a 48.5% prevalence of genotype 3,<sup>[16]</sup> whereas Chakravarti *et al.* have reported genotype 3 prevalence of 63%.<sup>[17]</sup> It shows that genotype 3 is more common in Tripura and only 25% are genotype 1 and there is no other genotype.

## CONCLUSION

The present study confirms the global trends of paradigm shift of mode of transmission of hepatitis C. At the time of discovery in 1989, hepatitis C was mainly due to blood transfusion but gradually other mode of transmission like hemodialysis and hospital-borne infection came out as important cause. However, PWID is one of the important modes of transmission of hepatitis C at present throughout the world. It has also shifted to younger age group leading to higher risk of HCV-related chronic liver disease in the future.

The genotypic distribution of HCV needs mapping in details and will provide an in depth knowledge of drug and disease migration in coming years.

The present study reveals that PWID is also becoming an important mode of transmission of hepatitis C in Tripura

and probably adjoining Bangladesh and other states of India.

This needs immediate intervention at community and society level. Scientific community needs to act in conjugation with social activist to reduce the burden of hepatitis C.

As at present no hepatitis C vaccine is available, an extensive global approach to prevent hepatitis C transmission is of paramount importance.

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