



Original Research Article

## SEROPREVALENCE OF HEPATITIS B AND HEPATITIS C AMONG BLOOD DONORS AT DHARAN, SUNSARI, NEPAL

Sabina Rai<sup>1</sup>, Pranita Dongol<sup>1\*</sup>, Hemanta Khanal<sup>2</sup>

<sup>1</sup>Department of Microbiology, Sunsari Technical College, Dharan, Nepal

<sup>2</sup>Department of Microbiology, Central Campus of Technology, Hattisar, Dharan

Corresponding author email: [pranitadongol@yahoo.com](mailto:pranitadongol@yahoo.com)

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### Abstract

Hepatitis B and Hepatitis C are the chronic viral infection that might be transmitted by blood transfusion. Nepal is known to have lowest seroprevalence in Asia. The main objective of the present study is to find out the prevalence of hepatitis B and Hepatitis C and their co-infection among blood donors during study period from March to August 2014. This was a cross sectional study among volunteer blood donors in Dharan who had donated the Blood. A total of 4930 donated blood samples were collected and screened for hepatitis B and hepatitis C by using a rapid enzyme immunoassay (EIA) technique. Among 4930 blood samples under study, the overall seroprevalence of hepatitis B were 0.22% (11 out of 4930) and hepatitis C were 0.39% (19 out of 4930) (P value = 0.01) and the prevalence being lower in females than males for both cases. Hepatitis B were more in age group of 21 -30 (0.4%) but hepatitis C in age group of 31-40 (0.5%). Hepatitis B and C are potential threats to be transmitted from unscreened blood.

**Key Words:**Seroprevalence, hepatitis B, hepatitis C, blood donors

### INTRODUCTION

Hepatitis B is a viral disease caused by hepatitis B virus (HBV) and hepatitis C virus are two important chronic hepatic infections. <sup>(1, 2)</sup> An acute or chronic viral infection is confirmed by presence of hepatitis B surface antigen (HBsAg) and antibodies to hepatitis C core antigen. <sup>(3, 4)</sup> In blood transfusion there is risk of hepatitis B and hepatitis C transmission due to window period of viral infection and precursors in diagnosis procedure and techniques. <sup>(5-7)</sup> WHO estimates more than 240 million people have chronic liver infections and more than 780 000 people die every year due to the acute or chronic infections of hepatitis B. <sup>(8)</sup> The transmission of hepatitis B by blood transfusion in Nepal is a risk because of diagnosis by a one-step enzyme immunoassay. Use of ELISA technique increases the diagnosis of early infections. <sup>(3)</sup>

From various studies from 1990 to 2009 in Nepal seroprevalence of hepatitis B and C is found to be below 1.5%. <sup>(9-14)</sup> The people with both hepatitis B and hepatitis C are

called HBV/HCV co-infections. Hepatitis B and C co-infection causes a serious mortality, morbidity and financial burden. <sup>(15)</sup>

The results of co-infection study in Nepal show various rate ranging from 0.71%. <sup>(16)</sup> The main aim of this study is to find out the seroprevalence of hepatitis B and C and their co-infections among blood donors of Sunsari District Nepal.

### MATERIALS AND METHODS

This was a cross-sectional study conducted in Sunsari District of Nepal in Nepal over a six months period from March to August 2014. The eligible blood donors selected according to criteria of standard operating procedure of Nepal Red Cross Society blood transfusion service. A total of 4930 donated bloods including mobile camps and bloods collected in the blood transfusion service were included in the study. Screening of hepatitis B and Hepatitis C were performed by enzyme immunoassay based test kits hepacard and HCV TRI-DOT rapid (J. Mitra and Co, New Delhi, India) by taking 5ml of blood from a blood pouch. A

positive serum was tested repeatedly by same test kits. The statistical analysis was done using SPSS ver 16.

## RESULTS

In Dharan, a total of 4930 blood samples were tested in whom 81.8% were male and 18.2% were female. Among 4950 blood

donors 11 (0.22%) donors were positive to HBV and 19 (0.39%) were positive to HCV. The HBV seroprevalence in male donors male seroprevalence were 0.18% (9/4032) and 0.04% (2/898) at p value <0.05.

**Table 1: Gender wise seroprevalence of HBV and HCV**

| Infection | Male      |              | Female   |              | Overall Seroprevalence % | P Value |
|-----------|-----------|--------------|----------|--------------|--------------------------|---------|
|           | Positive  | % Prevalence | Positive | % Prevalence |                          |         |
| HBV       | 9 / 4032  | 0.22         | 2 / 898  | 0.22         | 0.22                     | <0.05   |
| HCV       | 16 / 4032 | 0.4          | 3 / 898  | 0.33         | 0.39                     |         |

The overall highest seroprevalence of HBV (0.4%) in age group of 21-30 years followed by age group of 18-20 years (0.17%) and 31-40 years (0.06%) and age group above 41 years were found to be negative to HBV. In case of hepatitis C the age groups of 31-40 years were highest with seroprevalence of 0.5% followed by 21-30 years (0.43%) and below 20 (0.34%). The age above 41 years were negative to hepatitis C. Among all the blood donors 1/4930 (0.02%) was positive to HBV and HCV.

**Table 2: Age wise and gender wise seroprevalence of HBV and HCV**

| Age Group | Gender | Overall Sample Tested | Reactive to HBV (%) | Reactive to HCV (%) | Co-infection of HBV and HCV | P-value |
|-----------|--------|-----------------------|---------------------|---------------------|-----------------------------|---------|
| 18-20     | M      | 463                   | -                   | 1 (0.22)            | -                           | < 0.05  |
|           | F      | 127                   | 1 (0.79)            | 1 (0.79)            | -                           |         |
| 21-30     | M      | 1725                  | 8 (0.47)            | 8 (0.47)            | 1(0.05)                     |         |
|           | F      | 381                   | 1 (0.26)            | 1 (0.26)            | -                           |         |
| 31-40     | M      | 1291                  | 1 (0.88)            | 7 (0.54)            | -                           |         |
|           | F      | 296                   | -                   | 1 (0.34)            | -                           |         |
| 41-50     | M      | 465                   | -                   | -                   | -                           |         |
|           | F      | 83                    | -                   | -                   | -                           |         |
| 51-60     | M      | 88                    | -                   | -                   | -                           |         |
|           | F      | 11                    | -                   | -                   | -                           |         |
| Total     |        | 4930                  | 11 (0.22)           | 19 (0.39)           | 1 (0.02)                    |         |

## DISCUSSIONS AND CONCLUSIONS

The present study was carried out on Nepal Red Cross Society, Dharan branch for the detection of seroprevalence of hepatitis B, Hepatitis C and their co-infection. Out of 4930 blood samples were screened, 11 (0.22%) and (0.39%) were positive to hepatitis B and Hepatitis C respectively. The highest positivity of both hepatitis B and C were observed in male with age group of 21-30 followed by 31-40 with the similar rate of seroprevalence of 0.47%.

The seroprevalence of hepatitis B were highest in Banke (1.2%) followed by Morang (0.87%) and Kaski (0.35%) and HCV was highest in the Morang (0.26%) then in Kaski (0.16%) and Banke (0.11%) district of Nepal on a research conducted by Tiwari et al., in 2010. The nationwide prevalence of HCV was 0.54% and in central blood transfusion service in Kathmandu was 0.7% on previous study.<sup>(17, 18)</sup> The study shows hepatitis B and C seroprevalence are higher among males with rate of 0.18% and 0.40% than in females with rate of 0.04% and 0.33%

and this study is similar in results with the other researches performed previously. <sup>(14, 19, 20)</sup>

Previous study reported that the higher HBsAg carrier rate varied from 0 to 1.9% in Europe and America and 8 to 15% in Asian countries. <sup>(21-24)</sup> Blood donation is vital but there is a higher risk of blood borne transfusion Transmissible Infection in donated blood due to the window period of viral infections and it also increases the risk in disease transmission organ donation. <sup>(25, 26)</sup> Reduction of seroprevalence on blood donors can be reduced by strict donor selection criteria, education to donor and blood donation by regular volunteer donors only. Similarly proper counseling of infected donors might establish useful decrease the seroprevalence of transfusion transmissible infections among blood donors. The present study showed that the seroprevalence of HCV was higher than HBV. So, donor awareness program is recommended to reduce the risk of infections due to blood transfusion.

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