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Original Article

Seroprevalence of Hepatitis B and C in the Eastern Himalayan Region of India: A Population-Based Study

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ABSTRACT

Background: Although hepatitis B and C virus (HBV and HCV) infections are endemic worldwide, there is a significant geographic variability in its distribution. There is very limited epidemiological data pertaining to the prevalence of these infections in the general population of north eastern India.

Aim: The present population- based study was carried out to estimate prevalence of HBV and HCV infections in Eastern Himalayan region of India. It is a prospective study done over a period of one and half years from March 2013 to September 2014. Healthy persons were recruited from health camps organised at various locations in the district Darjeeling, the state of Sikkim and the neighbouring districts of West Bengal. Hepatitis B surface antigen (HBsAg) and anti-hepatitis C virus antibodies (anti-HCV) were tested by rapid diagnostic kit which is a in-vitro immunochromatographic assay designed for qualitative evaluation.

Results: A total of 2,314 persons were screened for HBV and HCV infections from 18 health camps in 10 locations in district of Darjeeling, state of Sikkim and the neighbouring towns. Forty seven (2.03%) and nineteen patients (0.82%) were found positive for HBsAg and anti HCV antibodies, respectively. Mirik and Kurseong had maximum prevalence rates of 6.66% (4/60) and 4.7% (8/170), respectively.

Conclusion: The epidemiology of hepatitis C infection in Eastern Himalayan region is different from that in the rest of north-eastern India.

KEYWORDS: Hepatitis B virus, Hepatitis C virus, Hepatitis C genotypes, Seroprevalence, Northeastern India.

Introduction

Both hepatitis B and C virus (HBV and HCV) have been recognized as major causes of acute and chronic liver disease worldwide. There is significant geographic variability in its distribution due to differences in socioeconomic conditions and cultural practices in different regions. The prevalence of HCV and HBV infections is not uniform throughout India. Studies regarding the prevalence of HBV and HCV infections in India are heterogenous in design. Most of the studies have been based on blood bank screening of voluntary blood donors and other high risk groups. Data pertaining to the prevalence of hepatitis B and C infection in the general population is limited. Here, we describe a population-based study of the prevalence of hepatitis B and C infection from the eastern Himalayan region of India.

Material and Methods

It is a prospective study done over a period of one and a half years from March 2013 to September 2014. Apparantly healthy people were recruited from health camps organised at various locations in the district Darjeeling, the state of Sikkim and the neighboring districts of West Bengal. Blood samples were collected from all those who were willing to participate and provide samples. Patients with known liver disease were excluded. Hepatitis B surface antigen (HBsAg) and anti-hepatitis C virus antibodies (anti-HCV) were tested by rapid diagnostic kit which is an in-vitro immunochromatographic one step assay designed for qualitative evaluation. In addition, participants answered survey questions on common risk factors for infection with HBV and HCV. Participantes with positive test results were counselled about the nature of the infection and its further management. All results are expressed as mean ± standard deviation (SD), median (range), or frequency (in percentage).

Results

A total of 2,314 persons were screened for HBV and HCV infection from 18 health camps in 10 locations in the district of Darjeeling, the state of Sikkim and its neighboring towns. Screening camps were arranged at Darjeeling, Kalimpong, Kurseong, Lava, Mirik, Namchi, Rangpoo, Gangtok, Islampur and Jalpaiguri. Out of 2,314 samples, 2197 samples were collected from the hills, however, 117 samples were collected from plain areas (Islampur and Jalpaiguri). The mean age of the participants was 41.99 years with a male:female ratio of 2.38:1.

Of 2,314 samples tested for infection, 47 (2.03%) and 19 (0.82%) were HBsAg and anti-HCV antibody positive, respectively.

Mirik and Kurseong had the highest rate of HCV infection, with prevalence rates of 6.66 % (4/60) and 4.7 % (8/170), respectively. The state of Sikkim and the plain areas (Islampur and Jalpaiguri) of nothern West Bengal showed low seropositivity for anti-HCV antibodies. Five (0.32%) of the 1,527 samples collected from Sikkim were positive for anti-HCV antibodies. . Interestingly, 117 people screened from plain areas (Islampur and Jalpaiguri) showed no seropositivity for anti-HCV antibodies.

A history of prior surgery and blood transfusion were present in 24.5% and 4.88% of participants respectively. Twenty three (0.99%) people had history of intravascular drug abuse. Most of the intravascular drug abusers were from Kurseong and Mirik locations of Darjeeling district.

Discussion

North-east Indian states are known for the demographic heterogeneity of its tribal population. Darjeeling district lies in the north of the West Bengal, in the foothills of the eastern Himalayas. Its boundary touches the North Eastern state of Sikkim, the Jalpaiguri and the North Dinajpur districts of West Bengal, and the state of Bihar. The Darjeeling district also touches three international boundaries with Nepal, Bhutan and Bangladesh. Darjeeling, Kalimpong, Kurseong and Siliguri are the major towns in the district. Mirik and Lava are other smaller towns of the Darjeeling district. There is no information about hepatitis B and C virus infection from these areas in the eastern Himalayan region of India.

There are 400 to 500 million carriers of HBV worldwide, with chronic HBV infection at a rate of 5%. The average estimated carrier rate of HBV in India is 3-4%. The professional blood donors constitute the major high risk group for HBV infection in India, with prevalence rate of 14%. As per the WHO report, HBsAg prevalence among general population ranges from 0.1% to 11.7%, being between 2% and 8% in most studies. If we analyse most of population-based studies from India, prevalence of HBV infection in general population appears to less than 3-4 %[1,2]. In a large community-based epidemiological study from West Bengal, Chowdhury *et al* have showed HBV prevalence of 2.9% (N=7,653). In a study conducted in Northern India, Sood *et al* have showed HBV prevalence of 1.3%. In another population based study a total number of 1,219 farmers of Punjab were screened with a HBV seroprevalence rate of 0.32%[2]. In a study from South India, 1.06% (N=1,980) were found to be HBsAg positive. In a study conducted at Gujarat, 0.694 % of 1,152 students were found to be HBsAg positive. In the present study, a total number of 2,314 healthy persons were screened for HBsAg with a seroprevalence of 2.03%.

The estimated global prevalence of HCV infection is around 2%, with 170 million persons chronically infected with the virus and 3 to 4 million persons newly infected each year[1]. As per several studies, prevalence of HCV infection in healthy blood donors is less then 2%. In contrast, two other studies on professional blood donors have shown very high prevalence of 55.3% and 87.3%[1].

A few population-based studies have been reported from different region of India[2,3]. The prevalence of HCV was 1.4 % in a group of people (N=704) recruited from a medical camp held in Andhra Pradesh. In another South Indian Study, the prevalence was 2.02% in a tribal population (N=890). A rural survey from Maharashtra (N=1054) showed a prevalence rate of 0.09% . The most systematic population-based study from the southern part of West Bengal (N=2,973) showed a seroprevalence of 0.87%[3]. Our study suggested that the prevalence rate of HCV infection is below 1 % in the general population of Darjeeling hills and Sikkim (a north-eastern state). However, the seroprevalence were higher in some locations such as Kurseong and Mirik which can be explained by the higher rate of drug abuse.

Studies have shown a high prevalence of hepatitis B (ranges from 10.8% to 100%) and C (ranges from 7.8 % to 92 %) in North eastern states of India. However, most of these studies were conducted in high risk groups. Few community-based studies from the north-eastern state of India (Arunachal Pradesh) have shown a much higher prevalence of HBV (21.2%) and HCV (7.89%) infection in local tribals (N=76)[1,2,3].

To summarise, our study has shown that the prevalence of hepatitis B and C infections in general population of the eastern Himalayan region of India are 2.03% and 0.82% respectively. As compared to the rest of the North-eastern states, the seroprevalence of HBV and HCV infections in this region is low. History of intravenous drug abuse is relatively uncommon in this region explaining the lower prevalence of hepatitis B and C. The results of this study are comparable with the other parts of India and eastern Nepal. In a study conducted at eastern Nepal very near to our study centres, the seroprevalence of HBV and HCV infection in healthy blood donors were 0.87% and 0.26 % respectively[4].

One of the limitations of our study is the use of rapid card test without confirmation with ELISA-based tests. The speed and simplicity of rapid card test makes it an attractive screening tool, especially where laboratory facilities are limited. Authors have shown that the sensitivity, specificity and positive predictive value of rapid card tests for both HBsAg and anti- HCV antibodies are to the tune of 90-100%[5]. The second limitation of our study was the recruitment of people from health camps organised only in the towns. The inclusion of recruits from villages could have given us a better representation of the population.

Conclusion

The prevalence of hepatitis B and C infections in the healthy population of the eastern Himalayan region of India is 2.03% and 0.82% respectively. The epidemiology of hepatitis C infection in this region is different from that of the rest of northeastern India.

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