

A Retrospective Hospital Based Study In Kathmandu to Assess the Seroprevalence of Hepatitis B Virus

Abstract

Background

Hepatitis B is a major public health issue in Nepal. Acute as well chronic Hepatitis B infection can lead to different hepatic manifestation ranging from acute liver failure, aplastic anemia and liver cirrhosis to liver cancer. Although, there is a presence of high burden of viral hepatitis in Nepal but little have been studied about it. So this study was aimed to obtain the seroprevalence of Hepatitis B among all the patients: outpatient as well as patient in different wards visiting a tertiary care hospital.

Methods

This was a retro prospective study conducted at a tertiary care hospital in which the data was obtained from the university register. The data documents the seroprevalence of Hepatitis B. In this study we have assessed total of 240 samples all of which were processed at Microbiology and Pathology laboratory using commercially available kits. Data were cleaned manually and analyzed using SPSS vs. 20.

Results

Out of 240 samples assed, 158 were males and 82 females and we found a total viral hepatic burden of 4.19% (10 samples). The mean age group of our study was 47 years (9 years to 85 years). Out of HBsAg screened positive population, HBV was seen mostly in males (90%) whereas lesser in female (10%).

Conclusions

Viral hepatitis usually does not follow any seasonal pattern so emphasis must be given to pre-exposure and post-exposure prophylaxis so that we can prevent people from casualties caused via viral hepatitis.

Key Words *Hepatitis, Seroprevalence,*

Introduction

Hepatitis B virus (HBV) is a major health problem in developing countries like Nepal and nearly 30% of total world population have been known to have either past or current HBV infections[1, 2]. It is considered as one of the major cause of acute and chronic liver diseases worldwide, accounting for over 360 million cases of chronic hepatitis and 620,000 deaths per a year[3]. On the basis of endemicity of HBV infection countries are classified into high ($\geq 8\%$) like South east asia, china etc; intermediate (2-7%) like eastern Europe :or low (< 2%) incidence countries like USA, Australia etc. [2]. Interestingly in Nepal albeit a lack of effective governmental policy to rein HBV infection there is a low prevalence rate with only 0.9% of total population suffering from it. With Surkhet district having the highest prevalence rate HBV is most commonly seen in people of Tibetan origin: Gurung's from Manag and Sherpa's from Solukhumbu area. All babies born after 2002 have been vaccinated against HBV in Nepal[4].

HBV is a member of viral genus orthohepadna and the family Hepadna viridae[5]. It is a double stranded

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DNA virus with known three antigens, Surface antigen (HBsAg), Core antigen (HBcAg) and antigen e (HBeAg), Further more HBsAg has a group specific antigenic determinant 'a' and two pairs of mutually exclusive subtype specific determinants 'd' or 'y' and 'r' or 'w' based on which HBV can be divided into four major subtypes: adr, adw, ayr, ayw[6]. Based on an intergroup divergence of 8% or more in the complete nucleotide sequence HBV have been divided into eight genotypes (A to H)[7]. Highly antigenic HBsAg is directly engaged in the induction of humoral immune response which delivers immunity against HBV infections[8]. The subtypes that are common in Nepal are 'ayw' (47%), 'adw' (34.3%) and 'adr' (4%) and unusual subtypes like 'ad', 'ay', and 'a' are rare. HBV genotypes D (69%) followed by A (22%) admits common genotypes whereas mixed infections (4.4%) and infections with genotype C (4.4%) are in lesser frequency in Nepal[9].

The transmission route of HBV may be via blood and blood products, vertical transmission, unprotected sex, and by sharing infected needles etc. In Nepal, 1% of population is carrier of HBsAg whereas 39% of patients suffering from chronic liver disease and 37% with hepatocellular carcinoma are HBsAg seropositive[10]. The aim of our study was to assess the seroprevalence of HBV in the patients (inpatient, outpatient) undergoing serology in a tertiary care hospital of Kathmandu, Nepal so as to assist strategies to improve public health and to prevent spreading of the disease in the local population

Material and Methods

This was a retro prospective study conducted at a tertiary care hospital in which the data was obtained from the laboratory register. In this study we included a total of 240 samples within a time period of 4 years dated 2011/12 to 2015/12. Preceding the study ethical approval was taken. All these patients were requested by clinician to perform HBsAg screening. Appropriate amount of blood was collected using aseptic technique. The serum samples of all patients

were screened for HBsAg using Immuno-chromatography Technique (ICT). Commercially available ICT kit (HEPA CARD: J.Mitra & Co. Pvt. Ltd, New Delhi, India) were used and samples were processed according to the manufactures guideline. The Kit that we used had an ability to detect 0.5ng/ml HBsAg. Other information like Age, Sex was also noted and the data was cleaned manually and analyzed using SPSS vs20.

Results

Out of 240 samples assed, 158 were males and 82 females and we found a total viral hepatic burden of 4.19% (10 samples). The mean age group of our study was 47 years (9 years to 85 years). Within the infected population HBV was seen mostly in males (90% or 9 positive cases) whereas lesser in female (10% or 1 positive case). Our study revealed that there was a high incidence of HBV mostly with people aged between 21 to 40. The most infected age group in males was found to be 21 – 30 where out of 53 total reference population, 9.43% were found to be HBsAg positive. The next most susceptible age group was 51-60 in which 6.66% of total populations were screened to be HBsAg positive. Furthermore in the age group 31-40, 4.76% whereas in the age group 41-50, 4.54% of the populations were screened positive. No individuals were screened positive in the age group 0-10, 11-20 and more than 60 respectively.

In the case of female, only one age group 31-40 was found to be susceptible. Out of 29 females assessed in this group 3.44% were screened positive for HBsAG.

In total the most prone age group was found to be 51-60 where 5.55% of the patients were infected followed by the age group 21-30 where 5.49% of total were screened positive. Similarly next most susceptible age group was 31-40 and 41-50 where 4.22% and 3.70% were screened positive respectively.

In number of infected cases, the highest number of infected cases was 5 in the age group 21-30 of boys, 3 in the age group of 31-40 including boys and girl, 1 in the age group 41-50 of boys and similarly 1 in the age group 51-60 of boys as well. The only age group in which male and female was found to be co-infected was 31-40. Other age group did not show any male and female co-infection. This data is summarized in Table 1:

Table1: Percentage positivity of HBsAg in different age groups

Age group In years	Male		Female		Total positivity in %
	Total	Positive Case	Total	Positive Case	
0-10	2	0	0	0	0
11-20	7	0	3	0	0
21-30	53	5(9.43%)	38	0	5.49%
31-40	42	2(4.76%)	29	1(3.44%)	4.22%
41-50	22	1(4.54%)	5	0	3.70%
51-60	15	1(6.66%)	3	0	5.55%
More than 60	17	0	4	0	0

Discussion

The seroprevalence of HBsAg in Nepal has been capricious ranging from 0.3% to 4% within a time duration of 1990 to 2003[11]. Our study revealed a prevalence rate of 4.19%. The variation in rate of prevalence may be due to capacity of hospital and different sample populations and diversified background of sample population. Our study was focused on hospital based population and our result is somewhat similar to the another study done in Nepal which showed a prevalence of 5%[12]. Whereas another study done in healthy population of Nepal revealed a low prevalence rate of 2.7% [13]. Similarly another study targeting healthy population also drafted a prevalence rate of 0.93% but a study done in Surkhet district of Nepal showed the

prevalence rate of 6.6% and further more this showed that the HBsAg was more dominant in males than in female[9]. This study result is similar to us as well as the study done by Bhatta[12]. This male dominancy may be due to the cultural aspects of Nepal where men are thought to be involved in outdoor activities whereas female are mostly restricted to do only household works. Another possible reason may be that women may not have easy access to health facilities when compared to males. Finally our study showed a high HBsAg prevalence in age group 20 to 45 and this was fair enough because population between 20 to 40 are sexually, physically, mentally and economically the most vibrant[13].

In addition, we should be aware that "occult HBV" has been described, especially in patients that are in a window period[14]. In a study of HBV occult infection among HIV positive patients, Opaleye et al found HBV DNA in 21/188 (11.2%) of patients without detectable HBsAg[15].

The limitation of our study is the method that we employed and a small sample size. Our results would have been more genuine if we had been able to perform the screening and confirmatory test like ELISA and Nucleic Acid Amplification Technique (NAAT). ICT is less sensitive than ELISA and Nucleic Acid Amplification Technique (NAAT) so may engender into false positive reactions.

Conclusion

Viral hepatitis usually does not follow any seasonal pattern so emphasis must be given to pre-exposure and post-exposure prophylaxis so that we can prevent people from casualties caused via viral hepatitis.

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