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SEROPREVALENCE OF HEPATITIS-B VIRUS IN MID AND FAR WESTERN REGION IN NEPAL

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ABSTRACT

Hepatitis B is significant health problems that might involve the late sequel of liver cirrhosis and hepatocellular carcinoma. The present study aimed to know the seroprevalence of hepatitis B virus (HBV) in mid and far western region in Nepal with various clinical conditions.

This was a retrospective study conducted in mid and far western region in Nepal, which was performed in the Central Laboratory of Microbiology at Nepalgunj Medical College and Teaching Hospital, Banke, Nepal during the period of September 2010 to April 2012. The serum samples were tested for Hepatitis B surface Antigen (HBsAg) by Sandwich immunoassay. Total 7010 patients including 43.72% male and 56.28% female were tested for HBsAg. Of them, 135 were positive and 6875 were negative.

In 135 positive cases 84 (62.22%) were male and 51 (37.77%)were female. In 6875 negative cases 2981 were male and 3894 were female. The seroprevalence rate of HBV was 1.93% in mid and far western region in Nepal. Seroprevalence of HBV seems to be higher in male then the female; it was 2.75% in male and 1.29% in female.

The study revealed that the seroprevalence of HBV was alarmingly higher in such a population, which probably reflects a high background prevalence of HBV infections should be taken into consideration and Implementation of community-based preventive measures and improved strategies for safe blood supply might prove useful to decrease the seroprevalence.

Keywords: seroprevalence , hepatitis B virus, Hepatitis B surface Antigen.

INTRODUCTION

There is high global prevalence of hepatitis-B. The Hepatitis-B virus (HBV) was discovered by Baruch Blumberg, he discovered the Australia antigen (Hepatitis B surface antigen, or HBsAg) in the blood of Australian aboriginal people in 1965.[1] Approximately, there are one-third of the world population has serological evidence of the past or present Hepatitis-B virus (HBV) infection, resulting in 350 million chronically infected people.[2] And over 1 million die annually of HBV-related chronic liver disease. Although many individuals eventually achieve a state of non-replicative infection, the prolonged immunologic response to infection leads to the development of cirrhosis, liver failure, or hepatocellular carcinoma (HCC) in up to 40% of patients.[3] In Nepal, seroprevalence of HBsAg has been reported ranging from 0.3% to 4.0% in general population by various studies conducted from 1990 to 2003.[4-10] The presence of HBsAg, the main surface protein of HBV, in serum indicates infection. Persistent presence of Hepatitis B surface antigen (HBsAg) for at least six months defines the chronic hepatitis B (CHB) carrier state.Conventionally, presence of secretory version of HBV core protein, the e antigen (HBeAg) , associated with high viral load and serves as a marker for viral replication.[11] After the initial characterization of HBeAg , a truncated form of the core (nucleocapsid) protein, all patients with both HBsAg and HBeAg are considered highly infectious.[12] HBeAg serconversion (HBeAg negative and anti HBe) is associated with liver disease remission and marks the transition from chronic Hepatitis B to asymptomatic HBsAg carrier state. At the time of HBeAg seroconversion, a small percentage of patients continue to show raised Alanine aminotransferase(ALT) and serum HBV DNA levels.[11] this group of patients is called as HBeAg negative chronic hepatitis B (CHB) which continues to have liver damage but due to frequent changes of ALT levels, become difficult to differentiate from inactive carriers.[13,14] Viral load quantification by PCR plays a vital role in the better management of this dreadful pathogen as diagnosis of different stages of HBV

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infection can be defined by serum HBV DNA levels especially in differentiating HBeAg negative CHB patients from inactive carriers.[15]

MATERIALS AND METHODS

Serum samples were collected from 7010 patients between the periods of September 2010 to April 2012. Samples were collected in clean, sterile, small test tube from suspected HBV infections and its sequelae patients attending out-patients and in-patients departments at Microbiology Laboratory of Nepalgunj College Medical & Teaching Hospital in Banke, Nepal. All the serum samples were tested by Virucheck-HBsAg kit (Orchid Biomedical system, Goa, India). The instructions, test procedure, reagents and accessories to follow were supplied with the kit.

RESULTS

Total 7010 patients were included in this study. 43.72% male and 56.28% female were tested for HBsAg (Figure 1).

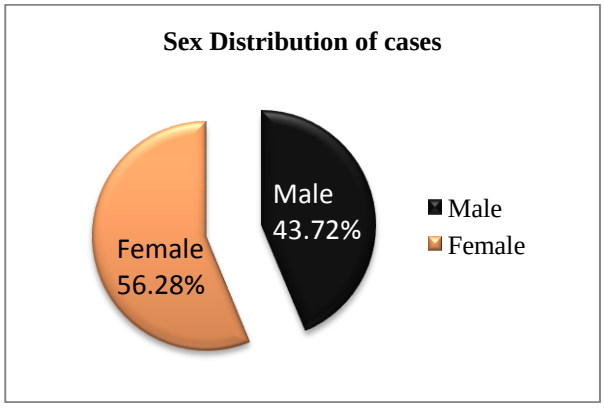

Figure.1
Sex Distribution of Cases

In this study, it was observed that 135 were positive and 6875 were negative. In 135 positive cases 84 were male and 51 were female. In 6875 negative cases 2981 were male and 3894 were female. Highest positive case were found in the age group of 21- 30 (Table 1 and Figure 2).

The seroprevalence of total case was 1.93%. Seroprevalence of total female was 1.29% and the seroprevalence of total male was 2.74% (Table 2). The highest seroprevalence of male found in the age group 21–30 was 4.53 and the highest seroprevalence of female found in the age group 0–10 was 5.37 (Table 3 and Figure 3).

Table 1
Seroprevalence of HBV According to Age Group Wise Distribution

Age	HBsAg		Total	seroprevalence rate (%)
	Positive	Negative		
0-10	12	472	484	2.58
11-20	4	1059	1063	0.38
21-30	49	1836	1885	2.60
31-40	16	1279	1295	1.24
41-50	23	927	950	2.42
51-60	11	634	645	1.71
61-70	14	412	426	3.29
> 70	6	256	262	2.29
Total	135	6875	7010	1.93

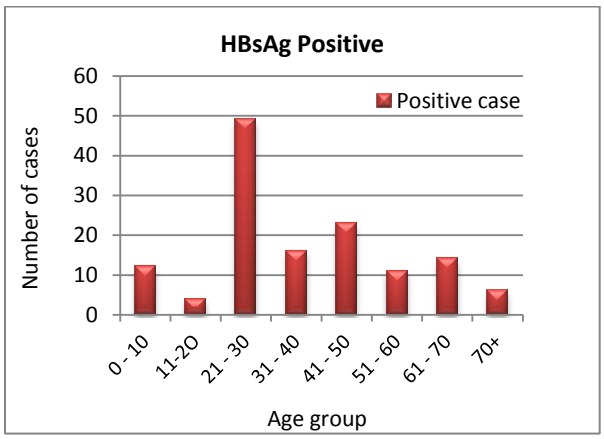

Figure.2
Age group wise distribution of total positive case.

Table 2
Sex Wise Seroprevalence of all Cases

Sex	HBsAg		Total	Sero prevalence rate (%)
	Positive	Negative		
Male	84	2981	3065 (43.72%)	2.74
Female	51	3894	3945 (56.28%)	1.29
Total	135	6875	7010 (100%)	1.93

DISCUSSION

The hepatitis B occurs throughout the world. It has no seasonal distribution. In the developed countries, the incidence is more in adults than in children and more in urban than in rural areas.

Table 3
Seroprevalence of HBV According to Sex Wise Distribution in different Age Groups.

Age	Sex	
	Male	Female
0-10	0.67	5.37
11-20	0.59	0.27
21-30	4.53	1.25
31-40	1.50	1.04
41-50	3.16	1.77
51-60	2.85	0.60
61-70	3.63	2.91
> 70	3.94	00.00
Total	2.74	1.29

However, in Africa and the Far East, where it is transmitted from mother to offspring or through close personal contact, it is more common in infants and children. In endemic areas, where carrier rates are >5%, most individuals are infected perinatally, by vertical transmission, or in early childhood.[16]

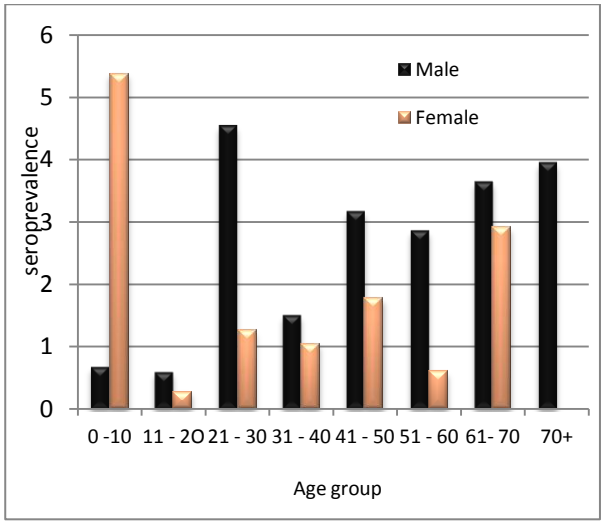

Figure 3
The comparative seroprevalence of male & female in different age group.

The carrier rate is higher in the tropical than in the temperate regions, more in males than in females. HBV is present in blood, saliva, semen, vaginal secretions and menstrual blood of infected individuals. Because HBV is resistant to breakdown outside the body, it is easily transmitted through contact with infected bodily fluids17. Perinatal vertical transmission is the most common mode of transmission worldwide. Presence of HBV e antigen (HBeAg) in the mother's serum is associated with greater infectivity18,19.The risk of perinatal HBV infection among infants born to HBV-infected mothers ranges from 10–40% in HBeAg negative mothers to 70–90% in HBeAg-positive mothers20. Children of HBsAg-positive mothers who do not become infected perinatally remain at high risk of infection during early childhood. In households of a chronically infected individual, HBV infection can occur via person-to-person, nonsexual contact20. Transmission is mainly by the percutaneous route. Besides blood transfusion, a number of therapeutic, prophylactic and diagnostic procedures can convey the infection. The virus is highly infectious and very minute amounts of some carrier sera (as little as 0.00001 ml) can transmit the disease. Therefore, any procedure that can convey traces of blood or serum from one person to another can serve to spread the infection. The disease is particularly common among drug addicts, prostitutes and male homosexuals. Certain groups and occupations carry a high risk of developing infection. These include medical and paramedical personnel, staff of blood banks and hemodialysis units, laboratory worker and staff of institutions for the mentally retarded. Outbreaks have occurred in hospital staff and patients.[21]

In this study, The seroprevalence rate of HBV was 1.93% in mid and far western region in Nepal. The seroprevalence of HBV seems to be higher in male then the female; it was 2.75% in male and 1.29% in female.The age specific seroprevalence in this study was also found to be higher (2.60%) in 21-30 year age groups.

CONCLUSION

This study shows that seroprevalence of viral hepatitis B was 1.93% and most commonly observed in males. The incidence is higher in adult age groups. Since there is no specific treatment, prevention has been the major aim in managing viral hepatitis B. Both pre-exposure and post-exposure administration of hepatitis B vaccine has been recommended. The policy to give pre-exposure prophylaxis to general population should be adopted as soon as possible, to prevent it emerging as a public health problem.

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