



A STUDY TO ASSESS THE SEROPREVALENCE OF HEPATITIS B AND ANTI HBS ANTIBODY LEVELS AMONGST HEALTH CARE WORKERS AND MEDICAL STUDENTS.

Microbiology

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ABSTRACT

Background: Hepatitis B(HBV) is a blood borne virus and it is one of the most important occupational hazards among healthcare workers (HCWs) & Medical students. This study aimed to measure the anti-HBs titres and to assess the seroprevalence of Hepatitis B in HCW and medical students. **Material and method:** It was a prospective, descriptive and cross sectional hospital based study. Medical students and healthcare workers who had received all three doses of hepatitis B vaccination were included in the study. **Result:** A total of 200 subjects, aged between 18 and 62 years were taken. 182 were vaccinated and 18 were unvaccinated. 85 were males and 115 females. Seroprevalence of Hepatitis B was nil. Antibody titres were >100mIU/ml in 51.6%, 10-100mIU/ml in 16.4% & <10 mIU/ml in 31.8% respectively. Negative correlation of decreasing antibody titer and age was seen. **Conclusion:** HCW and medical students are at higher risk due to their continuous exposure to blood products. Vaccination should be compulsory to the HCW and medical workers in the institution as Hepatitis B is a preventable disease. Monitoring of antibody titers should be done from time to time to see waning off antibody titers after vaccination.

KEYWORDS

INTRODUCTION:

Hepatitis B is a potentially life threatening liver infection caused by Hepatitis B virus. It is a major global health problem that can cause chronic liver infection and put people at high risk of death from liver cirrhosis and liver cancer. Hepatitis B virus (HBV) is a small enveloped DNA virus and is the only DNA virus in hepatitis viruses [1]

The clinical spectrum of HBV infection ranges from subclinical to acute symptomatic hepatitis or, rarely, fulminate hepatitis during the acute phase and from the inactive hepatitis B surface antigen (HBsAg) carrier state, chronic hepatitis of various degree of histologic severity to cirrhosis and its complications during the chronic phase. [2]

It is estimated that 240 million people are chronically infected with hepatitis B, and almost 686,000 people die yearly due to the complications caused by the infection. [3] India, reported a 3.7% point prevalence, i.e. over 40 million HBV carriers in India. A wide variation in prevalence of hepatitis B is observed from region to region and community to community [4]

The risk of contracting HBV by HCWs is four-times greater than that of general adult population. [5] Nearly 3 billion injections are administered annually in India, 1.89 billion are estimated to be unsafe due to inadequate sterilization, use of faulty techniques or unsatisfactory injection waste disposal [6] This study was undertaken to evaluate the seroprevalence of HBV and immune response to vaccination among HCW and medical students in our hospital.

MATERIAL AND METHODS:

A prospective, descriptive and cross sectional hospital based study was conducted in Department of Microbiology, DRPGMC Kangra at Tanda, Himachal Pradesh. 200 blood samples were collected from various HCW and medical student who fulfill the inclusion criteria with consent and aged more than 18 years.

Three to five ml of blood was collected under aseptic precautions. Serum separation was performed by centrifugation of the blood sample at 3000rpm for 5 minutes at room temperature. HBsAg was detected by Enzyme Linked Immunosorbent Assay using TRUSTwell kits and quantification of serum anti-HBs level was again done by ELISA using a commercially available Dia.Pro, Italy kit strictly adhering to the manufacturer's protocol.

RESULTS

There were 200 subjects of which 182(91%) were vaccinated and 18(9%) were unvaccinated. 85(42.5%) were males and 115(57.5%) were females. (Fig. 1) Age groups taken were between 18 to 60 years. Majority 117(58.5%) were between 18-30 years, followed by 53(26.5%) were between 40 to 60 and least 30(15%) were between 31

to 40 years. (Fig. 2)

Majority of the HCW were doctors 70(35%) followed by medical students 59(29.5%) and least were lab technicians 12(6%). None of the subjects included in the study was positive for HbsAg.

Antibody titres were >100mIU/ml in 51.6%, 10-100mIU/ml in 16.4% & <10 mIU/ml in 31.8% respectively. Preponderance was seen in subjects with vaccination history within 5 years. Mean antibody titers in age group 18-30 years was maximum with 223.3 and least 127.6 in age group 40-60 years. Mean antibody titers were highest in subjects receiving vaccination within 5 years duration as compared to subjects with history of vaccination for more than 10 years. (Table 1)

Negative correlation was found between age and antibody titers with spearman correlation coefficient -0.274 (Fig. 3)

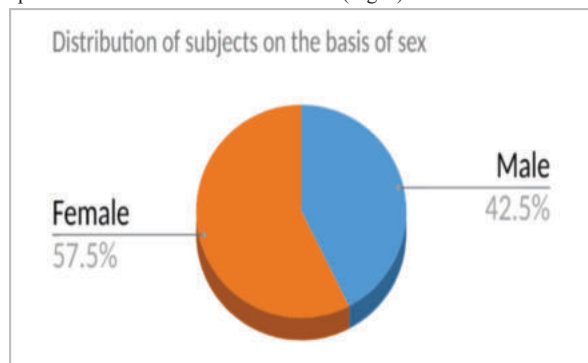


Figure 1. Distribution on the basis of sex

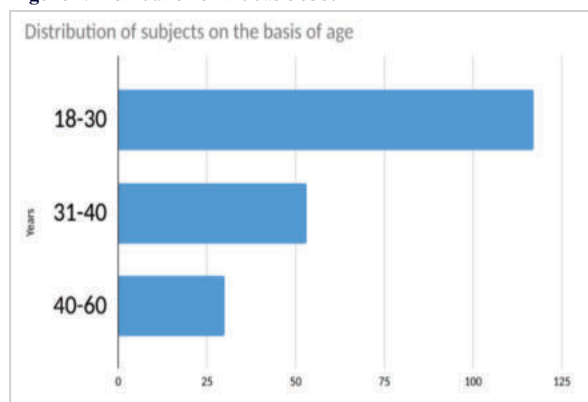
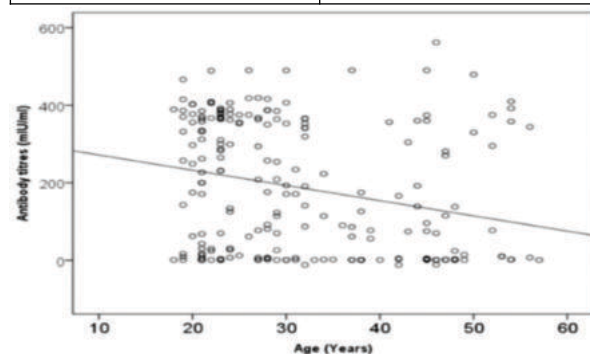


Figure 2. Distribution of subjects on the basis of age

Table 1: Distribution of factors related to HBV vaccination and Ab Titers

Occupation	Number (n)	Percentage (%)
Doctors	70	35%
Students	59	29.5%
Class IV	39	19.5%
Nurses	20	10%
Technician	12	6%
Duration of vaccination	Number (n)	Percentage (%)
≤ 5 years	128	70.3%
6-10 years	26	14.2%
> 10 years	28	15.3%
Mean Antibody titers in age groups	Ab titers (mIU/ml)	
18-30 years	223.3 mIU/ml	
31-40 years	139.1 mIU/ml	
41-60 years	127.6 mIU/ml	
Mean Antibody titers with duration of vaccination	Ab titers(mIU/ml)	
≤ 5 years	319.0 [200.0 , 378.0]	
6-10 years	87.0 [70.0 , 115.0]	
> 10 years	1.0 [1.0 , 3.0]	
Antibody titers	Ab titers(mIU/ml)	
<10	31.8%	
10-100	16.4%	
>100	51.6%	

**Figure 3:** Relation between increasing age and antibody titers**DISCUSSION:**

Hepatitis B infection is a major cause of liver cirrhosis and hepatocellular carcinoma. Vaccination is the effective way of preventing the infection and its complications. Anti-HBs antibody is an important serological marker to assess vaccine induced immunity to HBV.

Females were in predominance in our study with a male to female ratio of 1:1.3. Comparable results were seen in study by Sahana et al with the majority of females. Age group between 18 to 30 years were in majority in our study with 58.5% this could be due to inclusion of medical students in the study which correspond to this age group. In HCW's doctors were in preponderance in our study this can be justifiable due to much awareness about HBV in this group of individuals. [7]

Majority of subjects had a history of vaccination within the duration of 5 years; this could be due to recent implementation of mandatory Hepatitis B vaccination at the time of joining the health institution. Mean antibody titers were highest in the age group between 18 to 30 years this is due to the recent history of vaccination in this age group.

Negative correlation was seen with antibody levels and increasing age ,it denotes that with increase in age the levels of antibody titers tends to decrease. Similar results were seen in study by Sahana et al Farahnaz et al and Basireddy et al in their respective studies[7-9]

CONCLUSION :

Our findings explain that there was a waning of antibody titres level as the time since vaccination progressed. Evaluation of antibody titres after 5 and 10 years of vaccination is needed for determining titers and any need for a booster dose or revaccination. This should be made mandatory at least for healthcare professionals to avoid this deadly disease.

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