PREVALENCE OF HBsAg POSITIVITY IN HEALTH CARE WORKERS AND VOLUNTARY BLOOD DONORS AT BLOOD BANK OF GMC SRINAGAR KASHMIR

Ubaida jan ,[1]Aabid ahmad khanday[2], DR HK sidhu[3]

1. PG student at Desh Bhagat University Mandi Gobindgarh, Punjab, India.
2. Teaching assistant at, Desh Bhagat University Mandi Gobindgarh, Punjab
3. DR HK sidhu head of department school of paramedical sciences Desh Bhagat University Mandi Gobindgarh, Punjab

INTRODUCTION

Hepatitis B infection is one of the major public health problems globally and the 10th leading cause of death in world worldwide more than 2 billion of the population has reported evidence of past or recent HBV infection and there are more than 350 million chronic carriers of this infection in India, serum hepatitis prevalence among the general population ranges from 2 to 8% of the population which places India with 50 million of cases is also the second largest global pool of chronic HBV infection Among healthcare serum positive is 2-4 times higher than of the general population.

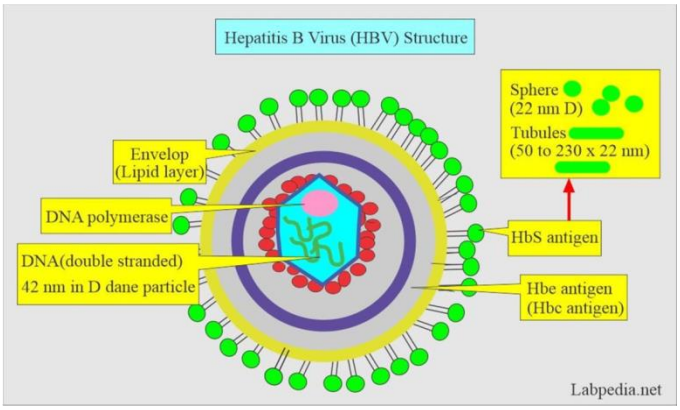
Occupational exposure of HBV is well recognized risk for health care workers and voluntary Blood Donor throughout the world, millions of healthcare professionals work in health institutions and it is estimated that 600,000 to 800,000 traumatic injuries occurs while handling in hospital & related works in a year , of which approximately 50% are not registered cases.

Hepatitis B is an infection illness caused by hepatitis B virus (HBV) which infection the liver of hominoidea species including humans, and causes an inflammation called hepatitis originally known as "serum hepatitis'' the disease has caused epidemics in parts of Asia and Africa , and endemic in china.

The clinical course of acute hepatitis B is indistinguishable from that of acute viral hepatitis caused by other agents. The incubation period ranges from 60 to 150 days (average 90 days clinical signs and symptoms

occurs more often in adults than infants or children ; who usually have an asymptomatic acute course illness. However; approximately 50% of adults who have acute infections are asymptomatic. The icterus phase is variable but usually lasts from 1to 3 weeks and is characterized by jaundice, dark yellow colored urine; light or gray colored stools; hepatic tenderness and hepatomegaly.

Most acute HBV infections in adults end up and results into complete recovery with elimination of HBsAg from the blood and the production of anti –HBs, Creating immunity against the future HBV infection As many as 90% of infants who acquires HBV infection from their mother at birth and children become infected between 1-5 years of age, becomes chronically infected. by adulthood, the risk of acquiring



chronic HBV infection is approximately 5% . Persons with chronic infection are often asymptomatic and may not be aware that they are infected however, they are capable of infecting others and have been referred as chronic carrier. Mortality, including different stage of chronic hepatitis, cirrhosis, hepatocellular carcinoma and lastly Hepatic failure.

Diagnosis of hepatitis B is also made by biochemical assessment of liver function. initial laboratory evaluation should include :total and direct / indirect serum bilirubin level, ALT, AST, Alkaline phosphatase, prothrombin time, total protein, albumin, serum globulin, A/G ratio, complete blood count, and coagulation studies.

There are no medications available for recently acquired HBV infection. Hepatitis B vaccine is available for the prevention of HBV infection. There are antiviral drugs available for the treatment of chronic HBV infection. currently five drugs are used for treatment of person with chronic hepatitis B. These drugs include Adefovir Dipivoxil, interferon Alfa-2b, pegylated interferon Alfa-2a, Lamivudine and Entecavir. Additional anti- viral drugs are under development.Hepatitis B can be prevented either before or right after exposure to the virus. To prevent disease before exposure, hepatitis B vaccine is recommended for all infants and children <19 years of age, people in high risk occupations (e. g, healthcare workers) and people with high risk behavior (e.g ,injection drug use or multiple sexual partners).The risk of hepatitis B infection B infection is well documented among healthcare workers & have 5-8times higher risk of transmission of HBV virus. Infection control precautions are the first line of defense to protect workers from hepatitis B and other blood-borne disease. Originally developed for hospitals, They apply to all situations where workers have risk of exposure to blood –born diseases transmitted by needle stick accidents or fluid contact with an open wound, non –intact skin, or mucous membranes .Routine practices are to be used in conjunction with other control measure. An example is washing hands whenever gloves are removed or

whenever the skin contacts potentially infectious fluids. Routine practices recommend the use of engineering controls, safe work practices, and personal protective equipment to suit the specific task and workplaces. Engineering controls include the use of equipment to isolate or contain the hazard, such as puncture– resistant containers for disposing of used sharp or biological cabinets for certain procedures in laboratories.

- Safe work practices are required for all tasks involving possible exposure to blood or certain body fluids. they include.

➢ Safe collection of fluids and tissues for disposal in accordance with local, provincial, territorial, or federal regulations.

➢ Safe removal and disposal or decontamination of protective clothing and equipment.

➢ Procedures to follow in the event of spills or personal exposures such as needle stick injuries.

➢ Specific and detailed procedures to observe when using and disposing of needles and others sharp objects.

➢ Although with the use of hepatitis B vaccine and following above precaution the incidence of HBV infection in health care workers and

There are several markers for the serological diagnosis of hepatitis -B infection in our study, HBsAg prevalence was studied by using ELISA (HEPALISA) Techniques among health care workers and voluntary blood donors of Blood Bank of Jammu and Kashmir, Srinagar. The samples takes were classified or grouped by their various different professional categories working at the Blood Bank of Jammu and Kashmir They were categories into five groups, according to major activities performed by them:

1. Doctors
2. Nursing staff
3. Voluntary blood donors
4. All technical staff (lab technician)
5. Lab Attendents And Sweepers doing general service.

Study Section

This study was conducted between Jan, 2023 to April, 2023 in the department of Transfusion Transmitted Microbiology Lab of Blood Bank of Jammu and Kashmir Srinagar.

 SANDWICH ELISA METHOD

(Microwell ELISA Test for the detection of Hepatitis B surface Antigen (HBsAg) in human serum/plasma)The viral Hepatitis B is termed as "Serum hepatitis". 1-5% infected people act as chronic carriers of HBV virus. Major part of the carriers secretes hepatitis B surface antigen (HBsAg) into blood and other secretion of the body like saliva and vaginal fluid these chronic carriers are potentially infectious

to other seronegative people. Hepatitis B virus belongs to a family of enveloped DNA virus, the Hepandanavirus. Related viruses in this group cause chronic hepatitis. The enzyme-linked immunosorbent assay (ELISA) is a test that uses antibodies and color change to identify a substance,

ELISA is a ppular format of "wet-lab" type analytic biochemistry assay that uses a solid-phase enzyme immunoassay (EIA) to detect the presence of a substance, usually an antigen, in a liquid sample or wet sample.

- STORAGE AND STABILITY
- The shelf –life of the kit is 15 months from the date of manufacturing. when stored at 2-8 c

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- **PRECAUTIONS FOR USE**

- Do not use kit components beyond the expiration date, which is printed on the kit.
- Avoid microbial contamination of reagent. the use of sterile disposable tips is recommended while removing aliquots from reagent bottles . Take care while preparing working substrate solution as vials of TMB concentrate & conjugate are of same size. Use TMB concentrate vial only.
- Prepare working substrate solution just 10 minutes prior to adding in the wells.

- **TEST PROCEDURE**

Fit the strip holder with the required number of HEPALISA strips. The sequence of the procedure must be carefully followed. Arrange the assay control wells so that well A-1 is the reagent blank from well A-1 arrange all controls in a horizontal or vertical configuration. Configuration is dependent upon reader software.

1. Leave A-1well as blank
2. Add 50ul Negative control in each well no. B-1 and C- 1 respectively
3. Add 50ul positive control in D-1, E-1& F-1 wells.
4. Add 50ul of sample in each well, starting from G1.
5. Add 50ul of working Enzyme conjugate to each well except A 1. Gently shake the plate for 2-3 second to mix the sample & conjugate.
6. Cover the plate and incubate in an incubator at 37
7. At the end of incubation period, take out the plate from incubator and wash with working wash buffer.

. **CALCULATION OF RESULT**

Test validity

Blank acceptance criteria

Blank must be ≤0.100 in case of differential filter being used. In case diffential filter is not available in the reader. The blank value may go higher.

Positive control acceptance criteria:

PC or PC× must be≥ 0.5 if is not so, the run is invalid and must berepeated.

PC 1.500E1 well 1.478F1 well Total 4.408

Mean absorbance

pc ×=4.408/3=1.469

Negative control acceptance criteria:

NC must be ≤ 0.150

0.012 B 1 well NC 0.010C1 well Total 0.022

Mean absorbance NC×=0.022/2=0.011

Cut – off value can be determined by using the following formula: cut

–off value =NC×+0.1

Where NC ×is mean absorbance (O.D) of Negative control.

E.g 0. 011+0.

OBSERVATION & RESULT

Data Set	Total No.	HBsAg positive	HBsAg positive[%]
Healthcare worker	75	11	14.6%
Voluntary donor	1200	20	1.7%

Prevelance of HBsAg in our study:

Out of the 75 health care workers and 1200 voluntary blood donors included in this study, 11(14.6%) health care workers and 20(1%) voluntary blood donors turned out to be HBsAg positive

HBsAg positive in relations to age group shown in table I and II Table

Among 75 healthcare workers include in this study, 11 of them were found HBsAg Reactive and remaining 64 were found to be Non- Reactive:

Table I Age specific HBsAg Reactive among Health care workers.

ge group(years)	of Healthcare workers	HBsAg positive	g positive(%)
18-25	27	3	11.111
26-35	23	5	21.7391
36-45	15	1	6.666
46-55	3	1	33.333
>55	2	1	50
Total	75	11	14.6

Table I shows age specific HbsAg reactive among healthcare worker, Age group 26-35 and maximum reactive cases 5 in numbers Among 1200 voluntary blood donors included in this study 20 of them found HbsAg reactive and remaining 1180 were found to be non-reactive.

Table II Age specific HbsAg Reactivity among voluntary Blood Donor

Age groups (Years)	No. of voluntary Blood	HbsAg positive	HbsAg positive %
18-25	500	6	1.2
26-35	300	9	3
36-45	180	2	1.11
46-55	150	2	1.33
>55	70	1	1.4285
Total	1200	20	1.7

Table II shows the age specific HBsAg reactivity among voluntary blood donor. Age group 26-35 found maximum reactive cases 9 in numbers.

HBsAg positivity in relation of sex group shows in following Table III& IV

Out of 75 healthcare workers working in GMC Srinagar Blood bankmale are 50 and female are 25 in numbers.

Table III Sex specific HBsAg Reactivity among health care workers

Sex	No. of Health care workers	HBsAg positive	HBsAg positive (%)
Male	50	8	6.25
Female	25	3	8.33
Total	75	11	14.6%

Total 75 health care workers included in this study: General services (Housekeeping workers and lab attendant) showed a relatively higher reactivity among other h workers. One nurse found reactive among 10 nurses and 3 lab technicians found among 33 lab technicians. Non reactivity observed among all 6 doctors.

Among 1200 voluntary blood donor included in this study 20 of them were found HBsAg reactive and remaining 1180 were found to be Non Reactive.

Table VI: HBsAg positivity in relation to occupation of voluntary Blood Donors

Occupation	ntary BloodDonors	HBsAg positive	HBsAg Positive %
Students	540	11	2.037
House wife	60	1	1.66
Private workers	400	6	1.5
Govt. services	100	1	1
Other(general population)	100	1	1
Total	1200	20	1.66

Total 1200 voluntary blood donors were included in this study. Among them student showed relativity. 06 private workers found reactive among 400 private workers and 1 person found reactive among 100 person of general population & 1 case was observed among 60 house wives.

Cause of HBsAg positivity among health care workers and voluntary blood donors shown in following Table VII and Table VIII.

Among 75 health care workers included in this study 11 of them were found HBsAg reactive and remaining 64 were found to be non-reactive.

Table VII: Cause of HBsAg reactivity among Health care workers

Cruse of Reactivity among Health care workers	HBsAg positive	HBsAg positive (%)
History unknown	2	2.66%
History of Blood Transfusion	0	-
Unprotected sex	0	-
Carrier (family History)	1	1.33%
Needle prick injury	8	10.66%
Total	11	14.66%

Among 75 healthcare workers total 11 were found HBsAg reactive. While Re-evaluating these reactive cases (history taken), 8(10.6%) had given history of needle pricking, one (1.33%) given family history of hepatitis infection and two cases (2.66%) could not reveal any relevant causes.

Among 1200 voluntary blood donors included in this study 20 of them were found HBsAg Reactive and Remaining 1180 were found to be Non- Reactive.

Table VIII: Cause of HBsAg reactivity among voluntary Blood Donors

Cause of Reactivity among voluntary Blood donors	HBsAg positive	HBsAg positive (%)
History Unknown	5	0.41%
History of Blood Transfusion	0	-
Unprotected Sex	1	0.083%
Carrier (family History)	13	1.083%
Needle prick	1	0.083%
Total	20	1.7%

Among 1200 voluntary blood donors total 20 donors were found HBsAg reactive. While Re- evaluating

these reactive cases (post donation counseling) 13 (1.083%) had given family history of hepatitis infection, One (0.083%) given history of unprotected sex, One (0.083%) given history of needle pricking during needle sharing and one case can not reveal any relevant causes.

In our study all tests are performed by Hepalisa (ELISA Method) Total 1275 Samples1200 voluntary blood donors and 75 health care workers) were included.

Result of Hepatitis test done by 75 ELISA methods among voluntary blood donors and health care workers shown in following Table IX and Table X.

Among 75 health care workers included in this study, 11 of them were Reactive and remaining were found to be Non-Reactive.

Table IX Result of Hepatitis Test among Health care worker

S. No.	Method	Total Test	Reactive	Nonreactive
1	Hepalisa	75	11	64

Among 1200 voluntary blood donors included in this study 20 of them were found HBsAg Reactive and remaining 1180 were found to be Non- Reactive.

Table X Result of Hepatitis test among voluntary blood donors

S. No.	Method	Total Test	Reactive	Nonreactive
1	ELISA	1200	20	1180

DISCUSSIONS & CONCLUSION

This study was conducted in Blood bank of GMC Srinagar, Kashmir Study done for a period of 4 months during this period 1200 voluntary blood donors who donated in Blood bank of GMC Srinagar, Kashmir and 75 healthcare workers of GMC Srinagar Blood bank included in present study.

HBsAg is one of the screening tests routinely done among blood donors as well as HBsAg infection is one of the known occupational hazards found among health care workers According to India Drugs &

Cosmetics act (1945) each blood unit has to be tested for Hepatitis B virus infection. And all health care workers should be vaccinated against HBsAg infection.

Over all prevalence of HBsAg in India is 2to 10% In my study total 1275 person (1200 voluntary donors and 75 health care workers) were included with seroprevalence of 2.4

Among 1200 voluntary blood donor's sero prevalence of HBsAg was observed 1.75% similar study done by MR JAHANGIR (2009) reveals sero prevalence of 0.62% among 960 voluntary blood donors of Coastal 1000 voluntary blood donors in Punjab during (1987-1992).

In my study among 75 health care workers prevalence of HBsAg was observed to be 14.6% similar study done by KK Ashok et al (2000) reveals 2:21 sero positivity among 208 health care workers in teaching hospital of Rea (MP).

The present study reveals that HBsAg infection was more prevalent among Health careworkers (14.6%) than voluntary donors was 1.7% similar study of sonwane et.al sighet al, also reveals this

The similar study conducted in western countries also shown 7-10 times higher prevalence of serological marker for Hepatitis B in health care workers un comparison of voluntary blood donors.

The following data provides a picture of HBsAg infection burden in India which comes HBsAg sero prevalence study done by various authors.

Place	Prevalence
New Delhi	<2.5%
Kerala	3.1%
Madurai	4%
Tamilnadu	1.37%
Kanpur	2.25%

The present study reveals that HBsAg infection seroprevalence was significantly high in health care worker as compared to voluntary blood donors. This can be explained by the factor in my study majority population was voluntary blood donors 1200 as compared to health care worker 75.

Among 1200 voluntary blood donors student were 540 and among these 11 student were student were (0.6%) found HBsAg positive persons taken from among and 6 wat found HBsAg reactive person taken

from general population were 100 and among was found HBsAg reactive Among 60(house wife) and 100 government servants no positive case of HBsAg infection was found.

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