

# Hepatitis-B: an Alarming Infectious Condition- How Aware are We???

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## Abstract

**Background & Objectives:** Infections caused by blood-borne pathogens like HCV, HBV or HCV have emerged as a hurricane for health-care workers. Among them, Hepatitis-B is a leading cause of morbidity & mortality all around the world especially placing health workers at higher occupational risks. Also percutaneous injuries in dental clinic are risk factors for transmission of HBV. Hence a bi-directional relationship exists between dentist & patient regarding transmission of HBV.

The present study is designed to evaluate degree of awareness & knowledge about HBV & status of vaccination against it, among the dental students & clinicians.

**Methods:** A cross-sectional study was conducted on 279 dental professionals including 41 clinicians, 45 post-graduate students, 80 interns and 113 B.D.S III & IV Yr students by means of a questionnaire. Data was collected & then analyzed in SPSS version-16.

**Result:** Our results were noteworthy that nearly 89.6% claimed that hepatitis-b is preventable. Positively, 90.71% subjects were vaccinated against HBV & 62.8% showed positive attitude towards HBV+ patients. However, some alarming findings are that 54.64% didn't know about post-exposure prophylaxis and 79.84% didn't have any idea about serum HBV DNA viral load considered safe according to CDC.

**Conclusion:** The present study consolidates the urgent need for further spread of knowledge & awareness about Hepatitis-B. We also highlight practice of "Standard Infection Control" measures and strict adherence to tenets of CDC guidelines. Hence the call of the hour is to spread awareness about Hepatitis-B which can turn to be a "mouse or an elephant in dental clinic."

**Keywords:** Blood-borne Pathogens, Anti-HBs Status, Serum HBV DNA Viral Load, Post-exposure Prophylaxis, CDC Recommendations, Standard Infection Control, Protective Personnel Equipment, Engineering controls

## 1. Introduction

One of the most sensitive issues mankind is facing today is the exposure to blood-borne pathogens, especially posing a serious risk to health care workers. In a dental clinic, transmission of blood-borne pathogen occurs predominantly by percutaneous or mucosal exposure of the dentist to blood or body fluids of infected patients.

Occupational exposures that may result in HIV, HBV or HCV transmission include needlestick and other sharps injuries; direct inoculation of virus into cutaneous scratches, skin lesions or abrasions; and inoculation of virus onto the mucosal surfaces of eyes, nose, or mouth through accidental splashes (Beltrami, Williams, Shapiro, & Chamberland, 2000). On the other hand, improper sterilization practices in dental clinic endanger the patients

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for the blood borne pathogens. Therefore a bi-directional relationship exists between the dentist & the patient regarding transmission of blood-borne pathogens.

Amongst the blood-borne infections, “Hepatitis-B” is a major public health problem around the globe. Approximately 2 billion people are infected with HBV making it the most common infectious disease worldwide. Over 350 million of those infected never rid themselves of the infection. HBV is a leading cause of chronic hepatitis, liver cirrhosis and hepatocellular carcinoma accounting for 1 million deaths annually (Lin & Kirchner, 2004). Studies have revealed that the risk of exposure for the dentists is 3–4 times greater and for non-immunized surgical specialists, about 6 times greater than that of general population (Nihat, Bengi, Şebnem, & Gülümser, 2011).

The emergence of the blood-borne pathogens and the increasing number of infected patients who are the prime concern in dental health care, compel the dental professionals to have thorough knowledge about contagious diseases. Henceforth, it is vital to evaluate the awareness about HBV infection due to close proximity of the dentists & the patients. With this consideration, the present study was designed to determine the awareness & knowledge about HBV and the vaccination status among the dental professionals & dental students in the cities of Haridwar & Rishikesh, Uttrakhand.

## 2. Methods

A stratified random cross-sectional study was done in the area of Rishikesh & Haridwar, Uttrakhand. A pre-structured multiple-choice questionnaire was the tool of data collection that consisted of 18 close-ended questions.

279 dental personnel’s voluntary participated in the study that included 41 dental clinicians, 45 post-graduate students, 80 interns & 113 B.D.S III & IV year students. An informed consent was taken from each participant and the anonymity of subjects was maintained throughout the study.

The questionnaire was administered to the dental professionals to assess –

- i) Awareness & Knowledge about HBV.
- ii) Behavior towards HBV by evaluating Vaccination status.
- iii) Clinical practices of safety measures & awareness about CDC recommendations.

Data was collected & analyzed using Statistical Package for Social Sciences (SPSS) version-16. Since the present study is a type of Computer-aided survey sometimes also erroneously referred to as double-blind trials, the software will not cause the type of direct bias between the researchers & the subjects.

Finally statistical analyses for the knowledge, attitude and behavior towards HBV were then evaluated and presented in form of simple tables and graphs.

## 3. Results

### 3.1 Regarding Awareness about HBV

Most of the subjects were aware of Hepatitis-B. Nearly 89.6% claimed that hepatitis-B is preventable. 53.05% had the correct knowledge that HBV belongs to hepadnaviridae family although the process of reverse transcription occur in it similar to retroviruses. 51.97% responded correctly that HBV is 50–100 times more infectious than HIV. Despite this awareness, only 42.65% knew that chronic hepatitis-b is asymptomatic. (Figure 1).

### 3.2 Regarding Transmission Mode

6% subjects respectively said that the body fluids & vertical transmission from infected mother to child are the main modes while 8% quoted that sexual contact & 10% had the notion that needle sharing are main modes of transmission of HBV. Remaining 70% were aware of all the modes of transmission of disease. (Figure 2).

Most surprisingly, although oral cavity is the operative field of the dentist, still 35.12% dental personnel were unaware that saliva is also a mode of transmission of HBV.

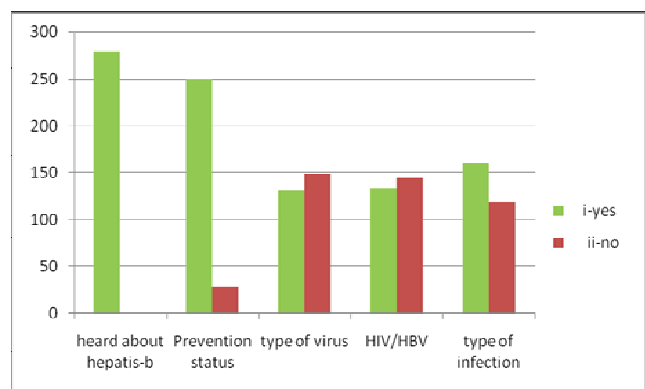


Figure 1. Status of awareness & knowledge about HBV.

### 3.3 Regarding Awareness about Complications of Chronic Hepatitis-B

Symptoms of chronic Hepatitis B can take up to 30 years to develop. Damage to the liver can silently occur during this time. Over the time, approximately 15%–25% of people with chronic Hepatitis B develop serious liver problems, including liver damage, cirrhosis, liver failure and liver cancer. Every year, approximately more than 600,000 people worldwide die from Hepatitis B-related liver disease (CDC, 2010).

In line of this study, we found that 32.61% subjects had no idea that chronic HBV infection confers a high risk of liver cirrhosis, hepato-cellular carcinoma, glomerulonephritis and may be fatal (Figure 3).

### 3.4 Regarding Vaccination Status

The best way to prevent Hepatitis-B is to get vaccinated. Positively in the present study, 90.71% subjects were

vaccinated against HBV. But only 83% out of them were fully vaccinated for all the three doses, hence remaining was vulnerable to disease. Unfortunately, 85.66% didn't go for antibody titre test to check response of the vaccine and need for booster dose. Furthermore, 89.96% subjects gave history of needle-prick in past 2 years, thereby putting a question mark on their susceptibility levels. Moreover results indicated that 54.64% dental personnel were unaware of post-exposure prophylaxis, therefore endangering their patients (Figure 4).

As recommended by CDC, post-exposure prophylaxis includes hepatitis-b immunoglobulins (HBIG)/ hepatitis-b vaccine series which should be initiated within 24 hrs to at least 1 week from time of exposure (CDC Recommendations & Reports, 2012).

### 3.5 Regarding Awareness about CDC Recommendations

Centers for Disease Control & Prevention has classified exposure-prone patient care into 2 categories:

- I) Category I- Procedures known or likely to pose an increased risk of percutaneous injury to a health-care provider that have resulted in provider-to- patient transmission of HBV.
- II) Category II- All other invasive & non-invasive procedures.

*Recommendations in this guidelines therefore stipulate the use of serum HBV DNA levels rather than hepatitis B e-antigen status, to monitor infectivity. Threshold value for serum HBV DNA viral load considered safe for practice is <1,000 IU/ml or <5,000 GE/ml (CDC Recommendations & Reports, 2012).*

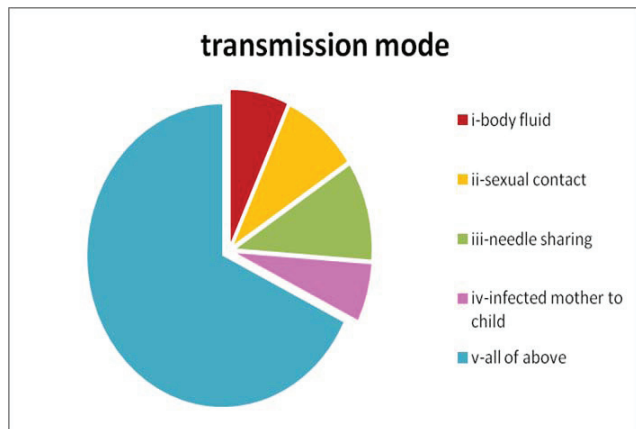


Figure 2. Knowledge about transmission mode of HBV.

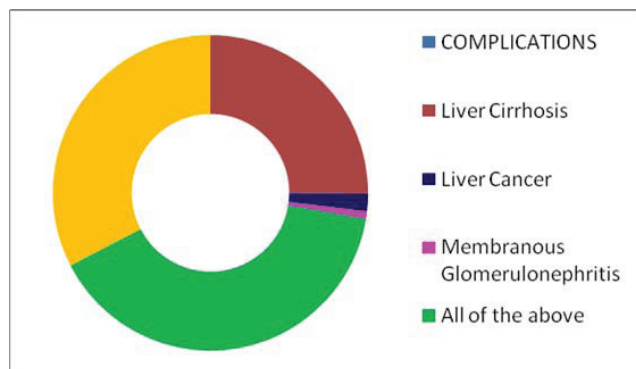


Figure 3. Awareness about complications of Chronic Hepatitis-B.

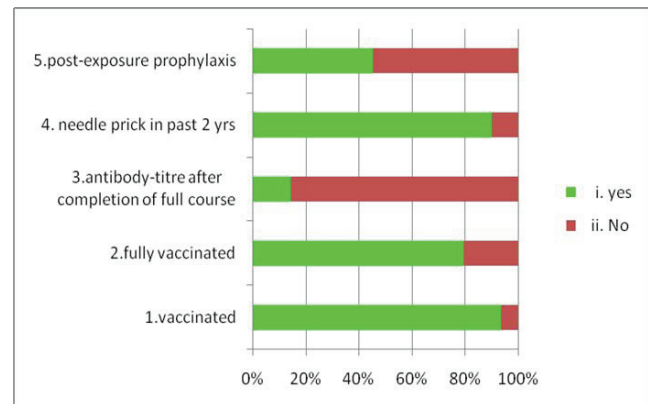


Figure 4. Assessment of vaccination Status.

In line with this study, our results were noteworthy that 79.84% subjects were unaware about it. This study explicitly emphasizes the need of implementing protocols of CDC. We explored that 36.5% didn't enquire about vaccination status of dental auxiliaries in their clinic (Figure 5).

CDC guidelines specify that employer make available hepatitis B vaccination series to all employees who are prone to have occupational exposure within 10 days of joining clinic (CDC Recommendations & Reports, 2012).

### 3.6 Regarding Clinical Practices

In this study, 62.8% showed positive attitude towards HBV patients. Furthermore, 92.11% advocated that patients undergoing surgical dental procedures should be investigated for HBV. However, we explored that 78% had no idea whether or not to perform exposure-prone procedures if the dentist himself is HBV positive. (Figure 6).

CDC recommendations state "HBV infection status alone does not require any curtailing of their practices. HBV-infected dentist can conduct exposure-prone procedures if low/undetectable HBV DNA load is documented by regular testing, at least in every 6 months." (CDC Recommendations & Reports, 2012).

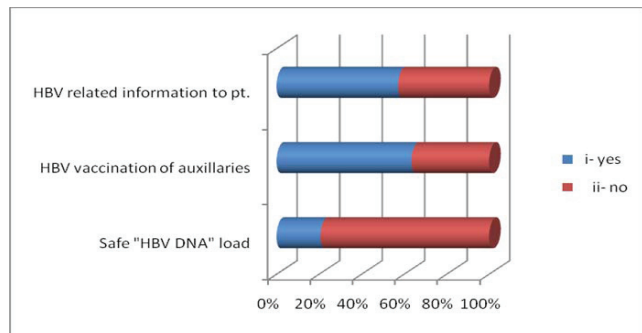


Figure 5. Knowledge about CDC guidelines.

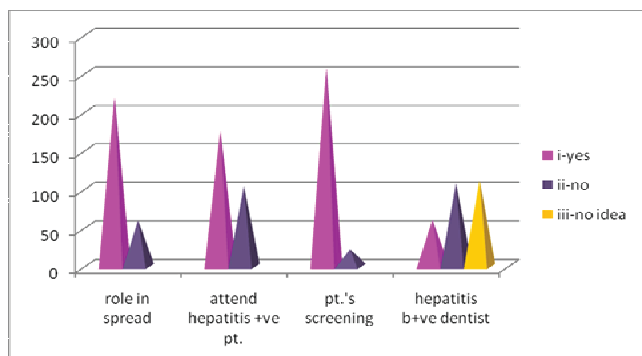


Figure 6. Assessment of Dentist-Patient Interaction.

## 4. Discussion

The present study consolidates the urgent need for further spread of knowledge & awareness about Hepatitis-B. We also highlight practice of "Standard Infection Control" measures and strict adherence to tenets of CDC guidelines.

- Safest bet is to get vaccinated. All dental professionals & students should receive hepatitis B vaccination, followed by assessment of anti-HBs to determine vaccination immunogenicity and, if necessary, revaccination. Health-care providers who don't have protective concentration of anti-HBs (>10 mIU/ml) after revaccination, should be tested for HBsAg and anti-HBc to determine their infection status (CDC Recommendations & Reports, 2012).
- Use of Protective Personnel Equipment (Figure 7) i.e wearing facemask, eye protection, gowns, gloves should be meticulously carried out in daily practice to prevent direct inoculation of virus into cutaneous scratches, skin lesions or abrasions; and inoculation of virus onto the mucosal surfaces of eyes, nose, or mouth through accidental splashes (OSHA Fact Sheet, 2001). There is a common probability that gloves might get punctured or torn during surgical dental procedures. In this direction, use of 'DOUBLE GLOVE' technique is an important safeguard (Figure 7).
- Practice of engineering controls like not recapping needles, use of puncture-resistant needle and avoidance of unnecessary phlebotomies should be encouraged (OSHA Fact Sheet, 2001) SCOOP technique should be used, if at all recapping of needle is required (Figure 7).
- Segregating the clinical waste & disposing it in color-coded plastic bags, is one of the best technique of simplifying waste disposal. Microbiological and biotechnological wastes are discarded or bagged in containers that are: *Closeable – Puncture-resistant – Leak-proof (if the materials have the potential to leak) – Red in color or labeled with the appropriate biohazard warning label* (OSHA Fact Sheet, 2001).

## 5. Conclusion

As it is said, "An ounce of prevention is worth a pound of cure"; so the urgent need of hour is that the storm of blood-borne infections should be carefully considered by our society as a whole.

## STANDARD PRECAUTIONS



**Figure 7.** Use of Standard Infection Control measures.

Every year on 28 July, World Health Organization (WHO) mark World Hepatitis Day with the goal of – “moving from awareness to commitment & action to address the “silent epidemic” of viral hepatitis”.

## 6. References

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## Questionnaire

1) Have you heard about Hepatitis-B?		
i. Yes	<input type="checkbox"/>	ii. No <input type="checkbox"/>
2) Is Hepatitis-B a -:		
i. Retrovirus	<input type="checkbox"/>	ii. Hepadnavirus <input type="checkbox"/>
3) Hepatitis-B infection is -:		
i. Symptomatic	<input type="checkbox"/>	ii. Asymptomatic <input type="checkbox"/>
4) HIV is more infectious than HBV.		
i. Yes	<input type="checkbox"/>	ii. No <input type="checkbox"/>
5) Hepatitis-B infection is preventable.		
i. Yes	<input type="checkbox"/>	ii. No <input type="checkbox"/>
6) What is the mode of transmission of Hepatitis-B?		
i. Body Fluid	<input type="checkbox"/>	ii. Sexual contact <input type="checkbox"/>
iii. Needle sharing	<input type="checkbox"/>	iv. From infected mother to child <input type="checkbox"/>

- v. All of the above  vi. None of the above
- 7) Is saliva a mode of transmission of HBV?  
 i. Yes  ii. No
- 8) Does Chronic Hepatitis-B lead to -:  
 i. Liver Cirrhosis  ii. Liver Cancer   
 iii. Membranous Glomerulonephritis   
 iv. All of the above  v. Have no idea
- 9) About Vaccination status-  
 a) Are you vaccinated for HBV?  
 i. Yes  ii. No   
 b) Are you fully vaccinated (3 doses)?  
 i. Yes  ii. No   
 c) Have you done measurement of antibody titre after completion of full course of vaccination?  
 i. Yes  ii. No
- 10) Are you aware of post-exposure prophylaxis for Hepatitis-B?  
 i. Yes  ii. No
- 11) Dentist & dental auxillaries have a role in spread of Hepatitis-B.  
 i. Yes  ii. No
- 12) Have you ever had needle-prick in past 2 years?  
 i. Yes  ii. No
- 13) Patients undergoing surgical dental procedures should be investigated for HBV?  
 i. Yes  ii. No
- 14) Would you attend a HBV infected patient?  
 i. Yes  ii. No
- 15) Dental personnel infected with Hepatitis-B should completely avoid patient's treatment?  
 i. Yes  ii. No   
 iii. Have no idea
- 16) Do you know about serum HBV DNA viral load considered "safe" for dental procedure according to CDC recommendation?  
 i. Yes  ii. No
- 17) Do you consider HBV vaccination status of dental auxillaries at the time of appointment in your clinic?  
 i. Yes  ii. No
- 18) Do you inform your patients about Hepatitis-B & its prevention?  
 i. Yes  ii. No