Awareness About Hepatitis B Virus Infection and Vaccination Among Health Care Personnel at Higher Risk - A Cross-Sectional Study

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ORIGINAL RESEARCH ARTICLE

Abstract

Background: Hepatitis B is a potentially life-threatening chronic viral infection. It is a well-recognized occupational hazard for health care personnel, but universal precautions and vaccination against Hepatitis B are the sine qua non to prevent this infection.

Objectives: To assess the awareness about Hepatitis B infection and vaccination status among the health care personnel at higher risk.

Settings and Design: Cross-sectional study among health care personnel at risk for exposure to blood and body fluids in a tertiary care hospital.

Subjects and Methods: A total of 288 health care personnel answered a pretested questionnaire on awareness about prevention, transmission and the vaccination status.

Statistical analysis used: Descriptive analysis.

Observations: A majority of the participants (79.16\%) were aware of routes of transmission and 277(96.18\%) participants were well-aware of preventive measures. Two hundred (69.44\%) health care personnel had completed the vaccination schedule for hepatitis B.

Conclusions: Results indicate an overall good knowledge and awareness among health care personnel. Vaccination prevalence among participants was lower than WHO standards.

Keywords: Awareness, health care personnel, Hepatitis B Virus, Hepatitis B vaccine

I. INTRODUCTION

Most patients with chronic Hepatitis B virus (HBV) infection are asymptomatic. Chronic complications like cirrhosis, hepatic failure, and HBV associated hepatocellular carcinoma are the major causes of morbidity and mortality associated with HBV infections [1].

Hepatitis B is a vaccine-preventable disease. W.H.O. recommends three doses of vaccine at 0, 1 month and six months and the coverage targets for hepatitis B vaccination should be at least 95\% coverage at the national level, and at least 85\% coverage in all districts [2].

Horizontal transmission from HBV infected patient occurs through needle stick/sharp injury or direct spill of blood or body fluids [3–5]. Cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, and amniotic fluid are also potentially infectious. Saliva and tears are not represented as an occupational risk for HBV infection unless they contain blood [6]. Health care personnel carry a higher risk for this occupation hazard as compared to general population [7]. Studies have shown that the risk of exposure for general dentists is about three to four times greater, and for non-immunized surgical specialists about six times greater than that of the general population [8].

Previous studies have reported the risk of HBV transmission is 30\% in susceptible health care personnel without post-exposure prophylaxis or adequate hepatitis B vaccination. This risk is significantly higher than that for hepatitis C virus (0.5\%) and for human immunodeficiency virus (HIV) (<0.3\%) [9].

Earlier studies have mentioned a comprehensive awareness of hepatitis B infection in more than 70\% of health personnel [8, 10-14]. Similar studies among health care personnel have...
reported a vaccination coverage ranging from 4% to 93%, many of which were not at par with W.H.O. standards [11, 15-25].

The present study was carried out to assess the awareness about Hepatitis B infection and vaccination status among the health care personnel at higher risk at a tertiary care centre.

II. SUBJECTS AND METHODS

A descriptive cross-sectional study was carried out in a tertiary care hospital. The study included health care personnel working in intensive care units, operation theatres, surgical branches, labour rooms, casualty, and dental professionals.

A predesigned self-administered questionnaire confined to knowledge and awareness regarding hepatitis B, its modes of transmission and prevention, and their vaccination status was prepared in a Microsoft Word document. Institutional Review Board had approved the study. We approached 300 health care personnel, out of which 288 participants completed the questionnaire. The data was organized and statistically analyzed using Microsoft Excel and Statistical Package for the Social Sciences (SPSS) software, version 22 IBM Chicago. Quantitative data was expressed in numbers and percentages as shown in table no. 1-4. In the section regarding routes of infection, there were ten questions. Results were assigned into three groups as shown in table no. 2. Results of questions on prevention of infection were assigned into three groups as shown in table no. 3.

Table no. 1: Responses about the hepatitis B virus

<table>
<thead>
<tr>
<th>Survey Questions About Hepatitis B virus infection</th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is Hepatitis B a contagious viral infection</td>
<td>264(91.6)</td>
<td>24(8.34)</td>
<td>0</td>
</tr>
<tr>
<td>6%</td>
<td>24(8.34)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>Do you think doctors and medical students are at risk of acquiring hepatitis B infection from the patients?</td>
<td>251(87.1)</td>
<td>24(8.33)</td>
<td>13(4.52)</td>
</tr>
<tr>
<td>5%</td>
<td>24(8.33)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>After needle stick injury or sharp injury: - the risk of transmission of HBV is more than that of HIV</td>
<td>173(60.0)</td>
<td>63(21.8)</td>
<td>52(18.0)</td>
</tr>
<tr>
<td>7%</td>
<td>63(21.8)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>Can HBV survive in dried blood</td>
<td>80(27.78)</td>
<td>95(32.9)</td>
<td>113(39.2)</td>
</tr>
<tr>
<td>%</td>
<td>95(32.9)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>Risk of chronic infection decreases with age</td>
<td>119(41.3)</td>
<td>126(43.7)</td>
<td>43(14.9)</td>
</tr>
<tr>
<td>2%</td>
<td>126(43.7)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td>Most patients of chronic HBV</td>
<td>34(11.81)</td>
<td>205(71.1)</td>
<td>49(17.0)</td>
</tr>
</tbody>
</table>
Collective awareness was about 77.69%. Good knowledge about the virus and the disease, and 79.16% questions in table 1, we found that 76.21% of participants had had nev.

Did not remember their status. Fifty vaccinated because they had received one dose or two doses or dose. Twenty doses of vaccination. Only 80 participants had taken booster inadequate.

Completion of the vaccination. Sixty (20.83%) participants mentioned that booster is administered at five years after vaccination schedule. Seventy populations.

Participants thought that vaccination is only for high risk. Hepatitis B vaccine is f.

Answered correctly for most of the questions on prevention. Two hundred twenty ts had

However answered correctly for most of the questions on transmission. Two hundred seventy-seven (96.18%) participants had answered correctly for most of the questions on prevention.

Seventy-nine (27.43%) participants opined that the Hepatitis B vaccine is for everyone and not restricted for the high-risk population. One hundred eighty-two (65.22%) participants thought that vaccination is only for high-risk populations.

Most of the participants (88.54%) had marked the correct vaccination schedule. Seventy-nine (27.42%) participants mentioned that booster is administered at five years after completion of the vaccination. Sixty (20.83%) participants agreed that antibody titre of 10 mIU/ml is considered adequate.

Only 200 (69.44%) participants had completed the three doses of vaccination. Only 80 participants had taken booster dose. Twenty-nine participants were marked as partially vaccinated because they had received one dose or two doses or did not remember their status. Fifty-nine (20.49%) participants had never been vaccinated.

<table>
<thead>
<tr>
<th>Mark the correct safe titre level (mIU/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 (20.83%)</td>
</tr>
<tr>
<td>140 (48.62%)</td>
</tr>
<tr>
<td>88 (30.55%)</td>
</tr>
</tbody>
</table>

Observations:

There were 201 men and 87 women. About one-third of participants (102) belonged to the age group 20-30 yrs. There were 104 medical consultants, 54 dental consultants, 88 postgraduate trainees, 26 nurses, and 16 interns.

The responses for questions about the Hepatitis B virus and disease are shown in table no 1.

Two hundred twenty-eight (79.16%) participants had answered correctly for most of the questions on transmission. Two hundred seventy-seven (96.18%) participants had answered correctly for most of the questions on prevention.

Seventy-nine (27.43%) participants opined that the Hepatitis B vaccine is for everyone and not restricted for the high-risk population. One hundred eighty-two (65.22%) participants thought that vaccination is only for high-risk populations.

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III. DISCUSSION

Knowledge about the virus and the disease:

A comprehensive review of responses to different questions in table 1, we found that 76.21% of participants had good knowledge about the virus and the disease, and 79.16% of participants had good knowledge of routes of transmission. Collective awareness was about 77.69%. These results are more or less akin to most of the earlier studies [8, 10–14] and higher than Yuan et al. (45.17%) [15].

We observed that 79.16% of participants knew about the routes of transmission. We compared our finding with studies like Saini et al. (88%), Punde et al. (average 67.89% in dental professionals), and Jaquet et al. (66.1%) [8,16,17].

In our study, 251(87.15%) participants were aware that being a health care personnel puts them at risk of acquiring HBV infection. We compared this finding with the study conducted by Akibu et al. where 75.9% of participants had emphasized upon this fact. In a study by Feleke et al., about 63% of participants perceived that they are not at risk for hepatitis B as against 8.33% in our study [19].

In our study, 173 (60.07%) participants knew that the risk of HBV transmission after needle-stick injuries is higher than that of HIV. Shindano et al. had observed in his study that only 8.3% of participants were aware of this risk [20].

Fattovich et al. had observed that approximately 90% of infants and 25%–50% of children between ages 1 and 5 years would have chronic HBV infection. By contrast, about 95% of adults would recover from HBV infection and would not have chronic infection [26]. Only 119 (41.32%) participants in our study were aware of this age-related finding.

HBV can survive outside the body for at least seven days and still be capable of causing infection [27]. Only 80 (27.78%) participants in our study were aware that the virus could survive in dried blood.

Awareness about Precautions and Prevention:

In our study, 277 (96.18%) participants exhibited good knowledge about prevention and universal precautions. In a study conducted by Hebo et al., 189 (82.2%) respondents had good knowledge about standard precautions [12].

Vaccination coverage:

The vaccination coverage in our study (69.44%) was lower than W.H.O. standards. If we add up complete and partial vaccination, then 229 (79.54%) participants in our study had received at least one dose. These results are quite similar to Punde et al. (77%), Paya et al. (87%), Jaquet et al. (71.4%), and Simard et al. (75%), Topuridze et al. (12% for physicians and 54% for nurses) Ziraba et al. (6.2%), Feleke et al. (4%) [16,17,19,21–24]. The common reasons identified for incomplete vaccination were missing or forgetting the date of the third dose, change of workplace which was conducting the course of vaccination, and never asking what to do on missing a dose.

Titre and booster:

In our study, sixty participants knew that minimum safe titre levels of antibody are 10 mIU/ml. Different studies have mentioned that antibody titre will remain at an adequate level in the majority of participants for a prolonged duration [7,28,29]. Bruce et al. had concluded that protection from the vaccine continues out to 30 years and ≥94% of the participants had evidence of protection (anti-HBs ≥10 mIU/mL or response to a booster dose of vaccine) [28].
In our study, 61(21.18%) participants opined that antibody titre is needed before booster and for post-exposure prophylaxis. Sahana et al. had concluded in their study that estimation of antibody titres after 5 and 10 years would determine the need for a booster dose which can be mandatory at least for health care personnel [7].

IV. CONCLUSION

Though the awareness about virus and vaccine were adequate, the vaccination prevalence could not achieve the W.H.O. standards.

The only safe strategy against the high prevalence of hepatitis B is prevention by employing universal precautions and vaccination. Health care personnel are a well-identified approachable group and developing regulations to vaccinate all health workers is an effective strategy to protect this high-risk group. A well - aware health care personnel who has completed his vaccination makes a considerable impact on social mobilization.

We also recommend the need for medical education modules and surveys at different levels of health care delivery systems to ensure optimum vaccine coverage by all caretakers, especially those at high risk.

Conflict of interests: none to declare.

Authors’ contributions: Abhijit Rayate and Nikhil Barhate contributed to the idea behind the manuscript, structure of questionnaire and collection of the data. Abhijit Rayate, Nikhil Barhate and Udaykiran Bhalge contributed to analysis of the data. Shree Dhotre, Pradnya Dhotre, Ajay Gavkare, Abhijit Rayate, and Basavraj Nagoba contributed to the literature search, revising the questionnaire, writing the paper, and modification of content and final approval of the draft.

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