Original Article

Hepatitis B Virus Vaccination Status and Knowledge about Hepatitis B Infection among Health Care Workers of Katihar Medical College, Bihar

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Abstract

Background: Hepatitis B (HB) is a global Public Health Problem infecting nearly 2 billion people around the globe. Health care workers are at risk of acquiring HBV, HCV, and HIV infections via exposure to patient’s blood and body fluids. HBV infection is a recognized occupational hazard and non immune professionals are at risk of acquiring the infection from their work.

Objectives: (1) To assess the level of HBV vaccination status among health care workers, (2) To assess the knowledge of health care workers regarding Hepatitis B infection and its transmission.

Methodology: An institution based cross sectional study was conducted in January to June 2018 covered all health care workers of Katihar Medical College. A self administered questionnaire was used for data collection about vaccination status and knowledge regarding Hepatitis B infection. The data was analyzed using epi Info version 7 statistical software.

Results: Overall 51.31% health care workers were found unvaccinated. The vaccination rate was higher among faculty members (90.91%) and Interns (67.07%). The major reason for poor vaccination among lab attendants and Group D workers was that they never thought about vaccination (85.84% & 88.66% respectively) followed by no need felt about HBV vaccination (89.38% & 92.54% respectively). There was poor knowledge about route and mode of transmission among lab attendants and Group D workers. 41.98% Group D workers said that hepatitis B is transmitted by faecal oral route and by insects (61.78%).

Conclusions: This study showed that hepatitis B vaccination status is poor among health care workers due to poor knowledge about HBV. A critical level of awareness and vaccination coverage is essential to decrease the possibility of transmission and burden of disease.

Keywords: Health Care Workers, Hepatitis B Virus, Vaccination, Transmission.

Introduction

Hepatitis B (HB) is an infection of liver caused by the Hepatitis B Virus (HBV). Hepatitis B is a global public health problem and is one of the most common infectious diseases in the world¹. Hepatitis B infects nearly 2 billion people around the globe, out of which 350 million suffer from chronic, lifelong infection². Around 15% to 40%
of the chronic HB patients are susceptible to develop liver cirrhosis and hepatocellular carcinoma. Since India has one-fifth of the world’s population, it accounts for a large proportion of global burden of HBV. India harbors 10-15% of the entire pool of HBV carriers of the world.

The risk of occupational infections in such developing countries is manifested by a variety of factors comprising to overcrowding in hospitals, poor health care workers and patient ratios, insufficiency or absence of basic safety and protecting equipment, partial awareness of exposure risk of blood and body fluid, reutilizing/reprocessing of contaminated needles and sharp instruments and poor knowledge about HBV. Physician, dentists, nurses, laboratory staffs and other hospital staffs are at high risk of acquiring infection via contact with blood and other body fluids. Among health care professionals HBV is transmitted by skin prick with infected, contaminated needles and syringes or through accidental inoculation of minute quantities of blood during the surgical and dental procedures. It has been seen in literature that the highest prevalence of HBV exists in the dentists. It has been recommended that prevention is a safeguard against the epidemic of viral hepatitis.

By knowing facts, having proper awareness, this disease can be prevented to a great extent. As health care workers remains at a high risk of transmission, it is very important for them to follow proper measure to infection control and prevention. This study was carried out with an objective to assess the level of HBV vaccination status and knowledge regarding transmission of HBV.

**Methodology**

The study was conducted among 1949 health care workers in a tertiary care hospital, Katihar Medical College, situated in Katihar district of Bihar State. The study was an institution based cross sectional study conducted to assess the HBV vaccination status and knowledge regarding HBV. The study period was from January 2018 to August 2018. A self administered questionnaire was used for interview and data collection after taking proper consent.

**Sample Size**

The sample included all health care workers of Katihar Medical College. Among all health care workers working, 1949 submitted the fully filled questionnaire. Among rest of respondents either response was incomplete or not submitted.

**Inclusion criteria**

All health care workers of Katihar medical college available during the study period.

**Exclusion criteria**-

Health care workers who were not in college during data collection period due to maternity, annual or sick leave and on field work.

**Operational Definitions**

1. **Vaccination status**-

Those health care workers who had received recommended three doses of HBV vaccine considered as vaccinated. Participants who had taken one/two doses of vaccine and those who had not received a single dose of HBV vaccine or status not known considered as Unvaccinated.

2. **Group D Staff**-

Those health care workers who were working as a ward boy/ attendant/ sweeper etc.

**Data collection and analysis**

The data collected after distributing and explaining the questionnaire to all participants. After being coded the data was transferred and analyzed using epi info 7 version of statistical software.

**Observation & Results**

In the present study the total sample size was 1949 and out of these 1000 (51.31%) health care workers were found Unvaccinated and remaining 48.69% were vaccinated.
Table 1: Vaccination status of HCWs

| S/No | HCW          | No. | Unvaccinated | Vaccinated |
|------|--------------|-----|--------------|------------|
|      |              |     | No. | %   | No. | %   |
| 1    | UG Students  | 480 | 325 | 67.71 | 155 | 32.29 |
| 2    | Interns      | 82  | 27  | 32.93 | 55  | 67.07 |
| 3    | PG Students  | 97  | 47  | 48.45 | 50  | 51.55 |
| 4    | Faculty Members | 253 | 23  | 9.09  | 230 | 90.91 |
| 5    | Nursing Staff | 329 | 130 | 39.51 | 199 | 60.49 |
| 6    | Lab attendants | 203 | 113 | 55.67 | 90  | 44.33 |
| 7    | Group D Staff | 505 | 335 | 66.34 | 170 | 33.66 |
|      | Total        | 1949| 1000| 51.31 | 949 | 48.69 |

The vaccination rate was the highest among faculty members (90.91%) followed by Interns (67.07%). Only 32.29% Undergraduate students and 33.66% Group D workers were vaccinated.

Table 2: Reason for Unvaccinated

| S/No | HCW          | No. | Never thought of Vaccination | No Need felt | Fear Of Injection | Status Unknown |
|------|--------------|-----|-------------------------------|--------------|-------------------|----------------|
|      |              |     | No. | %   | No. | %   | No. | %   | No. | %   |
| 1    | UG Students  | 325 | 199 | 61.23 | 99  | 30.46 | 57  | 17.54 | 101 | 31.08 |
| 2    | Interns      | 27  | 15  | 55.56 | 4   | 14.81 | 2   | 7.41  | 4   | 14.81 |
| 3    | PG Students  | 47  | 30  | 63.83 | 15  | 31.91 | 2   | 4.26  | 15  | 31.91 |
| 4    | Faculty Members | 23  | 0   | 0.00  | 0   | 0.00  | 0   | 0.00  | 20  | 86.96 |
| 5    | Nursing Staff | 130 | 60  | 46.15 | 51  | 39.23 | 49  | 37.69 | 42  | 32.31 |
| 6    | Lab attendants | 113 | 97  | 85.84 | 101 | 9.85  | 10  | 8.85  | 11  | 9.73  |
| 7    | Group D Staff | 335 | 297 | 88.66 | 310 | 92.54 | 38  | 11.34 | 30  | 8.96  |
|      | Total        | 1000| 698 | 69.80 | 580 | 58.00 | 158 | 15.80 | 223 | 22.30 |

When asked about reason for not taking the HBV vaccine, the answer varies between never thought of vaccination (69.80%), no need felt (58.00%), was very busy (29.10%) and fear of injection (15.80%). About 22.30% of HCWs not remembered their vaccination status.

Table 3: Knowledge about route of transmission of HBV

| HCW          | No. | sexual Contact | Infected Needle | Blood Transfusion | Sharing Sharps | Sharing Toothbrush | Sharing Towel | Fecal Oral Route |
|--------------|-----|----------------|-----------------|------------------|---------------|--------------------|---------------|-----------------|
|              |     | %              | %               | %                | %             | %                  | %             | %               |
| UG Students  | 480 | 62.50          | 85.42           | 88.13            | 41.67         | 10.42              | 11.25         | 20.83           |
| Interns      | 82  | 97.56          | 97.56           | 100.00           | 85.37         | 48.78              | 2.44          | 12.20           |
| PG Students  | 97  | 93.81          | 100.00          | 100.00           | 91.75         | 82.47              | 0.00          | 2.06            |
| Faculty Members | 253 | 98.81          | 100.00          | 100.00           | 99.21         | 98.42              | 0.00          | 0.00            |
| Nursing Staff | 329 | 88.45          | 97.26           | 96.96            | 91.49         | 45.90              | 3.04          | 12.16           |
| Lab attendants | 203 | 67.98          | 80.79           | 93.60            | 82.27         | 44.83              | 18.72         | 29.56           |
| Group D Staff | 505 | 39.80          | 39.21           | 49.50            | 40.40         | 39.21              | 78.61         | 41.98           |
| Total        | 1949| 69.32          | 78.09           | 82.81            | 65.78         | 44.07              | 25.71         | 21.75           |

There was poor knowledge regarding route of transmission among Group D workers, 78.61% said that HBV spread by sharing towels and 41.98% said that the route of transmission is fecal oral. Only 39.80% and 39.21% Group D staffs said that HBV can be transmitted by sexual contact and infected needle respectively. A high proportion of interns, PG students and Faculty members had good knowledge about route of transmission of HBV.
Table 4: Knowledge about mode of transmission of HBV

| S/No | HCW          | No.  | HBV Carriers | Eating Food Prep. By infected person | Coughed On by infected person | By holding hands | By Insects |
|------|--------------|------|--------------|-------------------------------------|------------------------------|-----------------|------------|
|      |              |      |              | No. | %  | No. | %  | No. | %  | No. | %  | No. | %  | No. | %  |
| 1    | UG Students  | 480  |              | 350 | 72.92 | 41 | 8.54 | 32 | 6.67 | 31 | 6.46 | 10 | 2.08  |
| 2    | Interns      | 82   | 82           | 100.00 | 0 | 0.00 | 1 | 1.22 | 0 | 0.00 | 1 | 1.22  |
| 3    | PG Students  | 97   | 97           | 100.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00  |
| 4    | Faculty Members | 253 |              | 253 | 100.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00  |
| 5    | Nursing Staff | 329  | 300          | 91.19 | 21 | 6.38 | 32 | 9.73 | 4 | 1.22 | 16 | 4.86  |
| 6    | Lab attendants | 203 | 150          | 73.89 | 36 | 17.73 | 32 | 15.76 | 39 | 19.21 | 40 | 19.70  |
| 7    | Group D Staff | 505  | 240          | 47.52 | 252 | 49.90 | 199 | 39.41 | 210 | 41.58 | 312 | 61.78  |
|      | Total        | 1949 |              | 1472 | 75.53 | 350 | 17.96 | 296 | 15.19 | 284 | 14.57 | 379 | 19.45  |

Majority of health care workers said that HBV carrier is mode of transmission. However 49.90% of Group D workers said that HBV can be transmitted by eating food prepared by infected person, being coughed up by infected person (39.41%), by holding hands (41.58%) and by insects (61.78%).

Table 5: Curability of HBV infection

| S/No | HCW            | No.  | Completely Curable | Partially Curable | Non Curable |
|------|----------------|------|--------------------|-------------------|-------------|
|      |                |      | No. | %  | No | %  | No | %  |
| 1    | UG Students*   | 480  | 98  | 20.42 | 82 | 17.08 | 300 | 62.50  |
| 2    | Interns*       | 82   | 2   | 2.44  | 5  | 6.10  | 75  | 91.46  |
| 3    | PG Students*   | 97   | 3   | 3.09  | 3  | 3.09  | 91  | 93.81  |
| 4    | Faculty Members* | 253 | 0   | 0.00  | 0  | 0.00  | 253 | 100.00  |
| 5    | Nursing Staff  | 329  | 71  | 21.58 | 99 | 30.09 | 159 | 48.33  |
| 6    | Lab attendants | 203  | 26  | 12.81 | 78 | 38.42 | 99  | 48.77  |
| 7    | Group D Staff  | 505  | 407 | 80.59 | 89 | 17.62 | 9   | 1.78   |
|      | Total          | 1949 | 607 | 31.14 | 356 | 18.27 | 986 | 50.59  |

χ² = 787.91, df=6, p<.0001
*Pooled together for Chi-Square Test

For curability of HBV infection 12.81% lab attendants said that HBV infection is completely curable while 38.42% said that it is partially curable. According to 31.14% of Group D workers HBV infection is completely curable, while 18.27% said that it is partially curable. There was significantly good knowledge regarding Non curability among UG students (62.50%), faculty members (100%), PG students (93.81%) and Interns (91.46%).

Discussion

In this study the HBV vaccination rate was higher among faculty members (90.91%) and Interns (67.07%). This finding is similar to study conducted by Singh and Jain, 2011 where 60% of medical students were completely vaccinated against HB. The lower vaccination rate among Undergraduate students, lab attendants and Group D workers might be attributed to fact that clinical year students have more knowledge about the disease and felt that the lack of awareness and knowledge are the commonest reason for not being vaccinated against HB (Younus et al). Majority of health care workers in this study identified blood transfusion and contaminated needle as the most important route of HBV transmission. However a relatively low proportion of them identified sexual contact and sharing of household tools as important route of...
transmission. In two other studies from Pakistan and India an even higher proportion of health care workers identified the most common mode of transmission of HBV correctly (Raza et al, 2008\textsuperscript{12}, Singh and Jain, 2001\textsuperscript{10}). Research from different settings has shown that blood and its products followed by infected needles are usually mentioned by most study participants as the most important route of transmission of HBV, particularly by health care workers (Raza et al 2008, Samuel et al 2009\textsuperscript{12,13}). Many study participants wrongly identified feco-oral route, eating food prepared by an infected person and cough as mode of transmission of HBV. Such wrong perception might be related to their confusion between Hepatitis A virus infection and poor knowledge regarding HBV, which is common among health care workers. Regarding curability of HB infection, 49.4% health care workers said that HB infection is either partially or completely curable. This was similar to study conducted among health workers by S Setia\textsuperscript{14}, 75.1% said that Hepatitis B infection is curable.

**Conclusion & Recommendations**

Health care workers knowledge about HBV is relatively poor, particularly in Lab attendants, Group D workers and UG students, with important gap which need to be filled. A critical level of awareness and vaccination coverage is essential in these health workers to decrease the risk of transmission and disease burden. Further research need to explore the reasons behind such poor knowledge in a more in-depth manner.

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