



Study on hepatitis B vaccination coverage among workforce of a tertiary care hospital in North India

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ABSTRACT

Hepatitis B is one of the most serious of the 20 blood borne pathogens which are the major threat to health care workers (HCWs). While a vaccine for hepatitis B exists, its utilization among HCWs and factors surrounding its utilization in many developing countries are unknown. This study was carried out to find hepatitis B vaccination coverage among work force of a tertiary care institute and various factors affecting its acceptance among health care workers. Cross-sectional study was carried for a period of six months at Sher-i-Kashmir institute of Medical Sciences (SKIMS), Soura. All the employees who consented to participate were taken up for this study. A self-administered, pre-structured questionnaire were used to collect data from all the participants. Of the 2763 employees studied, 71.4% were males and 28.6% were females with mean age of 40.46 years. 25.76% employees were completely vaccinated and 51.24% were unvaccinated. Among high risk group only 32.7% of employees were completely vaccinated. Also among fully vaccinated employees, no one had got their post vaccination titers done. Important reasons for not taking the vaccine were no knowledge regarding the vaccine (31.80 %), low level of perceived susceptibility for getting the infection (27.0%) and unwillingness to spend money or cost of the vaccine (26.24%). More awareness and education among HCW's is warranted to clear misconceptions and promote more acceptance of vaccine.

INTRODUCTION

Hepatitis B is one of the major public health problems and despite being ten times more common than HIV infection; it has so far not commanded the same public health response world-wide. According to an estimate, nearly 2 billion of the world's populations is infected with HBV that result in 350 million chronic cases and 2 million annual deaths.^[1] Hepatitis B is a disease caused by hepatitis B virus (HBV), which is transmitted through per-cutaneous or mucosal exposure to infectious blood or body fluids, mainly semen and vaginal fluid. Hepatitis B is one of the most serious of the 20 blood borne pathogens which are the major threat to health care workers (HCWs). It is a major problem because it can cause chronic infection, resulting in cirrhosis of the liver, liver cancer, liver failure and death. More-over, extra hepatic lesions can occur in other organs of the body particularly kidneys by deposition of immune complexes as result of this infection. Persons with chronic infection also remain carriers for HBV transmission.^[2]

Health care workers are at risk of acquiring blood borne disease including HBV due to occupational exposure to blood and body fluids. The World Health Organization (WHO) estimated that, of the 35 million HCWs worldwide, 3 million experience per-cutaneous exposures to blood pathogens each year, of these 2 million are exposed to hepatitis B virus.^[3] HBV can be prevented by practicing standard precautions such as regular personal hygiene, use of protective barriers, and by proper disposal of sharps, body fluids, and other clinical wastes in health care institutions.^[4]

Hepatitis B is a vaccine preventable disease for which safe and effective vaccine is available. Prevention of HBV is a public health priority and immunization with hepatitis B vaccine is the most effective means of preventing hepatitis B infection and its consequences. Adults who are at increased risk of infection and who should receive vaccination include: sexually active hetero-sexual adults with more than one sex partner in the prior 6 months or a history of sexually transmitted disease; men who had sex with men; illicit injection drug users, hemo-dialysis patients and persons at occupational risk of infection. The health care workers (HCWs) fall in the last category of high-risk groups.^[5] The risk of infection with hepatitis B (with an “e” antigen positive source) and hepatitis C after per-cutaneous exposure to blood is about 30% and 3% respectively.^[6] Among HCWs sero-prevalance of hepatitis B is two to four times higher than that of the general population.^[7]

While a vaccine for hepatitis B exists, its utilization among HCWs and factors surrounding its utilization in many developing countries are unknown. The present study was undertaken to assess hepatitis B vaccination coverage and to study factors affecting its acceptance among health care workers.

MATERIALS AND METHODS

This cross-sectional study was carried out from April 2014 to October 2014 for a period of six months at Sher-i-Kashmir institute of Medical Sciences, Soura. All categories of the workforce, which included doctors, nursing-staff, lab-staff, sanitation-staff, administration, laundry and linen, participated in the study. The participants were further broadly classified into high risk and low risk groups depending on the risk of exposure to infectious material. High-risk group include doctors, nursing staff, para- medic/ lab-staff, sanitation, laundry and linen. Low risk group included staff of the hospital administration who was not directly involved with the infectious agent. All the participants were explained the objective of the study and written consent was taken from each them. A self-administered, pre-structured questionnaire consisting of general information like designation, age, gender and questions regarding the status of hepatitis B vaccination and reasons for its acceptance and non-acceptance, were given to all participants who consented to participate in the study. Questions were explained whenever necessary and they were given assurance regarding confidentiality of their responses.

Depending upon the vaccination status the respondents were categorized as completely vaccinated, incompletely vaccinated and unvaccinated. Completely vaccinated referred to those who had received three doses of hepatitis B vaccination at 0, 1 and 6 month. Partial or incompletely vaccinated referred to those who had received 1 or 2 dose of hepatitis B vaccine and not vaccinated to those who have not received any dose of the vaccine.

Collected data were analyzed using SPSS 21 Software. Appropriate statistical tests such as Percentage distribution and Chi- square were used to derive any significant differences among the responses given by health care workers. The significance level was set at $p < 0.05$.

RESULTS

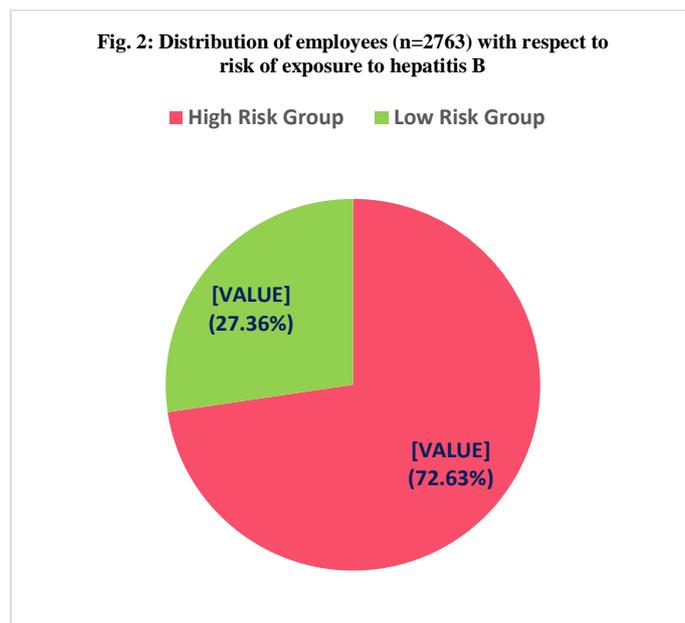
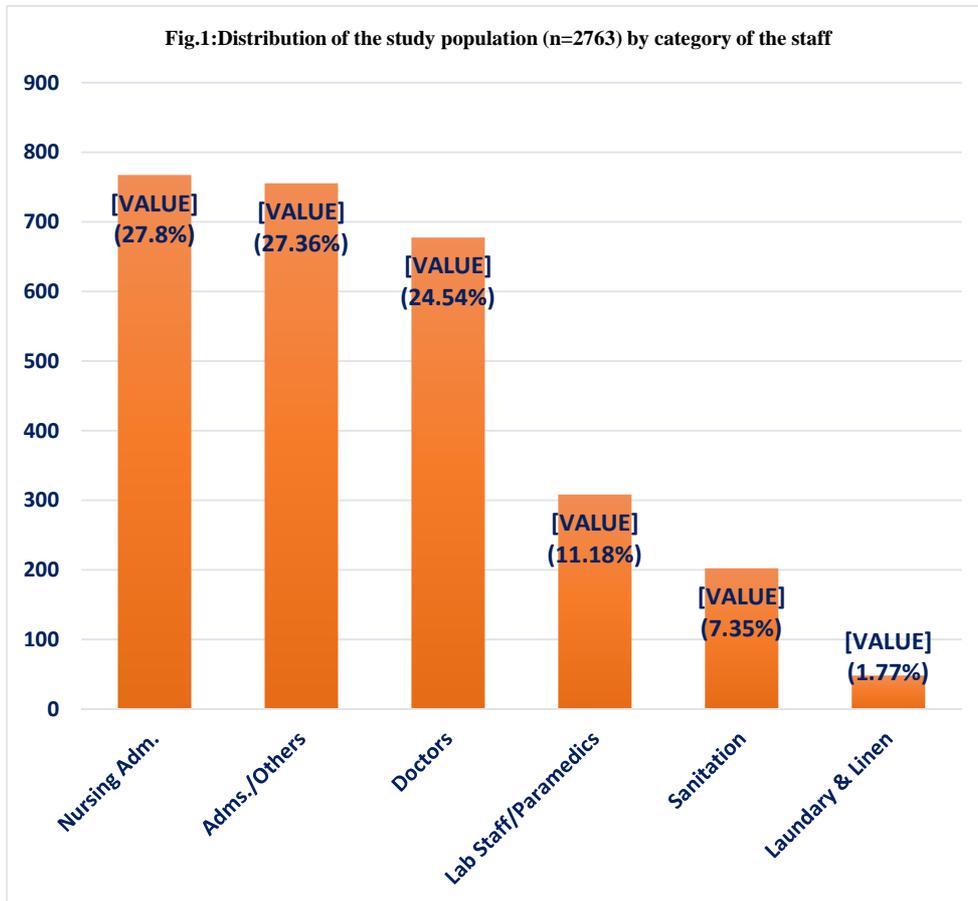
Among 2763 employees who participated in the study, 71.4% were males and 28.6% were females. Mean age of employees was 40.46 ± 10.1 years. 57.9% of employees were between 31-50 years of age while only 17.1% were above 50 years of age (Table 1).

Table 1: Distribution as per age and sex of employees

| <i>Socio-demographic characteristics</i> | <i>Number</i> | <i>Percentage</i> |
|--|---------------|-------------------|
| Age (Mean: 40.46 , SD:10.1) | | |
| ≤ 30 Years | 691 | 25.0% |
| 31-50 Years | 1600 | 57.9% |
| > 50 Years | 472 | 17.1% |
| Gender | | |
| Male | 1974 | 71.4% |
| Female | 789 | 28.6% |

Out of total 2763 employees, 27.8% belonged to nursing staff, 24.5% were doctors, and 27.36% belonged to administration and rest of employees 11.1%, 7.35%, 1.77% belonged to lab staff, sanitation, laundry and linen respectively (Fig.1). 72.63% of employees belonged to high risk group and 27.3% to low risk group. High- risk

groups included (doctors, nursing staff, para- medic/ lab-staff, sanitation, laundry and linen). Low risk group included staff of the hospital administration who were not directly involved with the infectious agent (Fig.2).



Vaccination Status:

Out of all employees studied (n=2763) for hepatitis B vaccination coverage, 51.24% were unvaccinated, 25.76% were fully vaccinated and 23.23% were partially vaccinated (Fig. 3).

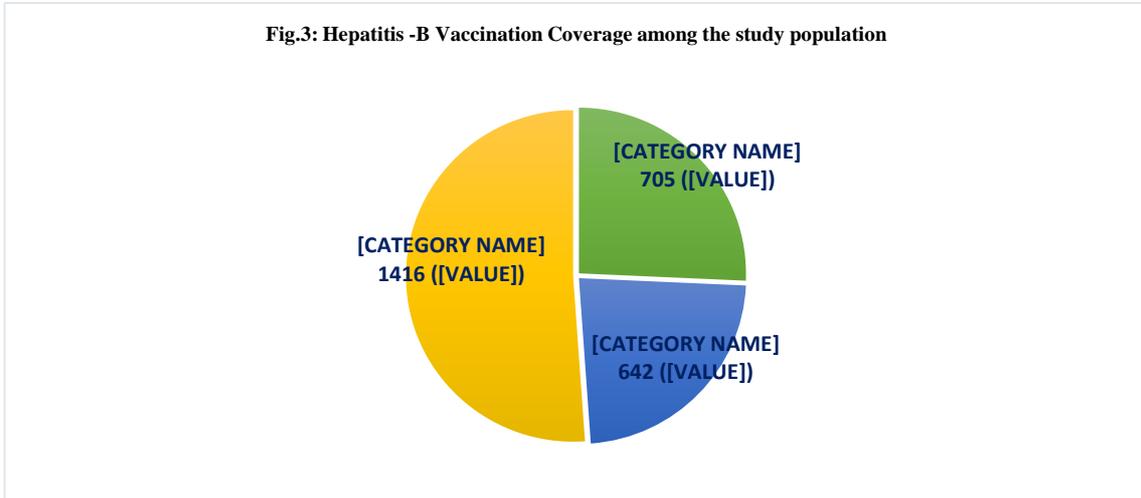


Table 2 shows that in all the three age groups maximum proportion of employees are unvaccinated and the differences were found statistically significant (p=0.000). The proportion of complete vaccination was found higher in females (30.3%) as compared to males (23.6%) and the differences were statistically significant (p= 0.000). With respect to designation, 47.5% of doctors, 29.9% of nursing staff, 25.2% of laboratory staff, 18.4% of laundry staff, 9.4% of sanitation staff and only 6.3% of administrative staff were found completely vaccinated against hepatitis B. Among doctors, 52.5% (22.7%+29.8%) were either incompletely or unvaccinated.

Table 2: Vaccination status with respect to age, sex, designation and risk group of employees

| Variable | Hepatitis B Vaccination Status | | | | Test of Significance |
|-----------------------|--------------------------------|-------------------|---------------------|------------------|--------------------------------------|
| | Complete No.(%) | Incomplete No.(%) | Unvaccinated No.(%) | Total No.(%) | |
| Age(Years) | | | | | |
| ≤ 30 | 232(33.6) | 145(21) | 314(45.4) | 691(100) | $\chi^2=34.911$ df=4 p=0.000 |
| 31-50 | 369(23.1) | 369(23.1) | 862(53.8) | 1600(100) | |
| >50 | 104(22.0) | 128(27.1) | 240(50.9) | 472(100) | |
| Total | 705(25.76) | 642(23.23) | 1416(51.24) | 2763(100) | |
| Sex | | | | | |
| Male | 466(23.6) | 429(21.7) | 1079(54.7) | 1974(100) | $\chi^2=32.29$ df=2 p=0.000 |
| Female | 239(30.3) | 213(27) | 337(42.7) | 789(100) | |
| Total | 705(25.76) | 642(23.23) | 1416(51.24) | 2763(100) | |
| Designation | | | | | |
| Doctors | 322(47.5) | 154(22.7) | 202(29.8) | 678(100) | $\chi^2=657.140$ df=10 p=0.000 |
| Nursing Staff | 229(29.9) | 200(26) | 339(44.1) | 768(100) | |
| Lab Staff | 78(25.2) | 94(30.4) | 137(44.4) | 309(100) | |
| Laundry & linen Staff | 9(18.4) | 21(42.8) | 19(38.8) | 49(100) | |
| Sanitation Staff | 19(9.4) | 104(51.2) | 80(39.4) | 203(100) | |
| Administrative staff | 48(6.3) | 69(9.1) | 639(84.6) | 756(100) | |
| Total | 705(25.76) | 642(23.23) | 1416(51.24) | 2763(100) | |
| Risk Group | | | | | |
| High risk | 657(32.7) | 573(28.6) | 777(38.7) | 2007(100) | $\chi^2=463.863$ df=2 p=0.000 |
| Low risk | 48(6.3) | 69(9.1) | 639(84.6) | 756(100) | |
| Total | 705(25.76) | 642(23.23) | 1416(51.24) | 2763(100) | |

Administrative staff had least percentage with only 6.3% employees fully vaccinated. These differences were statistically significant (p = 0.000). Among high risk group employees only 32.7% were completely vaccinated

while 28.6% were partially vaccinated and 38.7% were unvaccinated. Among the fully vaccinated employees, no one had got their post vaccination titers done.

Reasons for not vaccinating among unvaccinated employees:

Important reasons for not taking the vaccine were no knowledge regarding the vaccine (31.80 %), low level of perceived susceptibility for getting the infection (27.0%), unwillingness to spend money or cost of the vaccine (26.24%), fear of side-effects of the vaccine (7.34%) and other reasons (7.62%).

Knowledge regarding Hepatitis B infection:

66.7% of employees have knowledge about Hepatitis B infection and an almost similar percentage of employees (66.0%) were knowing how hepatitis B infection is transmitted. The source of information among those who know about hepatitis B was; books/professional knowledge in 37.9%, newspaper in 20.4%, television/radio in 13.3% and internet in 9.9%.

Risk of getting Hepatitis B infection:

The majority (68.5%) of the employees indicated that they consider themselves at somewhat high risk of getting hepatitis B infection. Almost all doctors (98.4%) and sanitation staff (98.5%) consider themselves at risk of getting hepatitis B infection while performing their duties followed by nursing staff (87.5%). Among administrative staff 22.5% consider themselves at risk while among staff of linen and laundry only 10.2% employees considering themselves at risk hepatitis B infection.

DISCUSSION

Health care workers are at a greater risk of various blood-borne infections. Vaccination against hepatitis B is effective in protecting 90-95% adults.^[8] Hepatitis B vaccination is not well accepted and according to WHO estimates, hepatitis B vaccination coverage among HCW's varies from 18% (Africa) to 77% (Australia and New Zealand).^[9] In our study, of the 2763 employees, 25.76% were fully and 23.23% partially vaccinated against hepatitis B. A similar study done by Vishal B et al showed that 49.6% HCW's were fully vaccinated.^[10] A lower percentage of fully vaccinated HCW's was observed by Rambha P et al.^[11] However a study conducted in Agha Khan hospital, Karachi wherein 86% of HCW's are found fully vaccinated.^[12] Reasons for lower percentage of fully vaccinated in our study could be because all the staff which included both high risk HCW's and low risk employees were studied.

In our study, vaccination coverage among doctors was 47.5%, 29.9% in nursing staff, 25.2% in laboratory staff, 18.4% in laundry staff, 9.4% in sanitation staff and 6.3% in administrative staff. This difference of immunization among different cadres of employees can be explained on the basis of their awareness for the disease and educational status. Similar results of vaccination rates were reported by Shrestha and Bhattarai^[13] and Imam et al.^[14] In our study younger HCW's were more likely to have been vaccinated 33.6% (age \leq 30 years) versus 23.1% (age 31-50 years) and 22% (age > 50 years). Resende et al also made similar observations.^[15]

Another interesting finding in our study was difference in vaccination coverage between males and females. Rate of acceptance of vaccination was higher (30.3%) in females as compared to males (23.6%). Similar findings were noted in a study by Rambha P et al.^[11]

The current study also attempted to find out the reasons that could possibly account for poor compliance of vaccine among HCW's. Acceptable level of knowledge of hepatitis B infection was found to be significantly associated with acceptance of vaccine. Knowledge of hepatitis B infection and hepatitis B vaccine resulted in positive attitude among HCW's. In our study the main reason for non-acceptance of hepatitis B vaccine was 'no knowledge regarding the vaccine' in 31.8% followed by 'low level of perceived susceptibility for getting the infection' in 27% and 'unwillingness to spend money/cost of vaccine' in 26.24%. the result were consistent with the findings of Hafeez-ur-Rehman Mengal et al^[16] and Mc Grane and Staines^[17] who reported that obtaining information relating to benefits of vaccine from a physician or a nurse was a significant factor in acceptance of vaccine.

CONCLUSION

Current study shows low hepatitis B vaccination coverage among the HCW's with only 25.76% of all HCW's being completely vaccinated. Among the high risk group HCW's only 33.7% were found completely vaccinated against hepatitis B. Also among fully vaccinated employees, no one had got their post vaccination titers done. Important reasons for not taking the vaccine were no knowledge regarding the vaccine (31.80 %), low level of perceived susceptibility for getting the infection (27.0%) and unwillingness to spend money or cost of the vaccine (26.24%). More awareness and education among HCW's is warranted to clear misconceptions and promote more acceptance of vaccine. Better accessibility may be another effective method for more acceptance. Also HCW's have a right to be protected against hepatitis B. To this effect, National policies and guidelines advocating and supporting mandatory hepatitis B immunization need to be put in place.

Acknowledgment

We acknowledge the help rendered by Mr. Javaid Ahmad (Sociologist department of community medicine) during the data collection phase of this research.

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