

REGULAR SCREENING OF ANTI-HBS ANTIBODY TITRE AND THE NEED FOR BOOSTERS AMONG HEALTH CARE WORKERS IN A TERTIARY CARE HOSPITAL IN PATNA

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ABSTRACT

BACKGROUND

Health care workers because of their contact with patients and with potentially infectious materials have risk of exposure to infectious diseases, some of which are preventable by vaccination. The goal of immunisation for appropriate intervention in the health workforce is critical to prevent and control infections. Antibodies-HBs indicate presence of immunological memory. Their persistent negativity indicates the need to complete the vaccination series with two additional doses followed by a new serological testing after one month.

The objective of this study is to evaluate anti-HBs antibody titre among vaccinated health care workers and to determine awareness level of antibody titre among HCW at IGIMS, Patna.

MATERIALS AND METHODS

A prospective study was carried out. A total of 92 nursing staffs, laboratory technicians, paramedical staffs, doctors and students were tested to evaluate their immunity toward hepatitis B. The anti-HBs antibody levels were detected using the anti-HBs ELISA test (enzyme immunoassay diagnostic kit for in vitro qualitative detection of antibody to hepatitis B surface antigen in human serum or plasma). Inadequate immune response to HBV vaccination was considered if quantitative anti-HBs level was <10.0 mIU/mL according to the Centre for Disease Control (CDC).

RESULTS

Of the 92 vaccinated health care workers, anti-HBs antibody titre was noted and only 47 (51.08%) had protective titre.

CONCLUSION

Our study represents one of the first experience in IGIMS regarding the level of anti-HBs antibody titre in health care workers. The low titre emphasises the need for monitoring vaccination status among health care workers.

KEYWORDS

Antibodies, Hepatitis B Virus, Immunisation.

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BACKGROUND

Health care workers (HCW), because of their contact with patients and with potentially infectious materials have risk of exposure to infectious diseases. The goal of immunisation is to prevent and control infections. Antibodies-HBs indicate presence of immunological memory. Their persistent negativity indicates the need to complete the vaccination series with two additional doses followed by a new serological testing after one month. With 50 million cases,

India is also the second largest global pool of chronic HBV infections.¹ It has been reported that about 10% of the health care workers (HCWs) in India have acquired HBV infection.² The risk for developing serologic evidence of HBV infection was 37% to 62% if the blood was positive for both HBsAg and hepatitis B e-antigen, and 23% to 37% if the blood was positive for HBsAg and negative for hepatitis B e-antigen.³ HCWs exposed to needle stick injuries (NSIs), blood containing HBV or both are at risk for developing clinical hepatitis.^{3,4} Low vaccination rates among HCWs have been reported in Nigeria, South Africa and India.⁵⁻⁷

Objective

To evaluate anti-HBs antibody titre among vaccinated health care workers and to determine awareness level of antibody titre among HCW at IGIMS, Patna.

MATERIALS AND METHODS

The study was conducted at IGIMS, Patna.

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Study Design and Sample Size

This was a questionnaire-based, cross-sectional study conducted with HCWs. Health care workers (whose activities involved contact with patient’s blood or other body fluids while providing care) such as doctors (including postgraduates and interns), nurses, lab technicians and paramedical staffs were considered for the study.

Pretesting appropriate questionnaire was prepared to collect information regarding occupation, Hepatitis B vaccination status and details about doses.

Sample Collection

Four millilitres of whole blood were collected from each respondent. Then the sera were separated and frozen at -20° C until tested. The anti-HBs antibody levels were detected using the HBsAg ELISA commercially available kit (Bioneovan) (enzyme immunoassay diagnostic kit for in vitro qualitative detection of antibody to hepatitis B surface antigen in human serum or plasma). Inadequate immune response to HBV vaccination was considered if quantitative anti-HBs level was < 2.088 (OD-0.104)

Data Collection

Permission was obtained from the Institutional Ethics Committee to conduct the study. It was made clear that the participation was voluntary. The completed forms were collected and the data analysed.

RESULTS

92 HCWs participated. Of the participants, 70 (76%) were females and 22 (24%) were males. The distribution according to designation of the participants was as follows: 21 (23%) doctors, 26 (28%) nurses and 45 (49%) laboratory technicians and paramedical staffs (Table 1). Of the 92 vaccinated health care workers, anti-HBs antibody titre was noted and only 47 (51.08%) had protective titre. In all 4 (4.3%) of 92 HCWs had taken at least 1 dose of vaccine, 23 (25%) had taken 2 doses of vaccine, 42 (45.6%) had taken 3 doses of vaccine, but no booster. Complete primary vaccination and booster was taken by 20 (21.8%). 3 (3.3%) did not remember the vaccination dose (Table 2). Correlation of dose schedule with antibody titre is shown in (Fig. 1). Sex distribution of protected antibody titre among health care workers is illustrated in (Table 3, Fig. 2 and 3).

3 doses with booster	20 (21.8 %)	16 (17.4 %)	4 (4.3 %)
Not remembered	3 (3.3 %)	2 (2.2%)	1 (1.1%)
		54	38

Table 2. Correlation of Dose Schedule with Antibody Titre (n= 92)

Sex	Protected	Not Protected	Total
Male	11	11	22
Female	43	27	70
	54	38	92

Table 3. Sex Distribution of Protected Antibody Titre among Health Care Workers

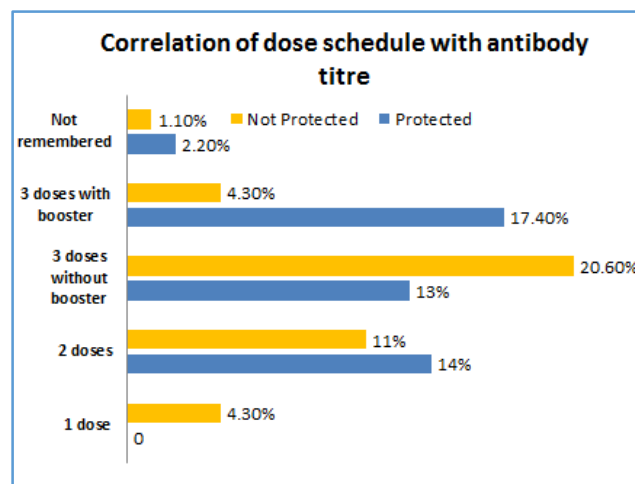


Figure 1

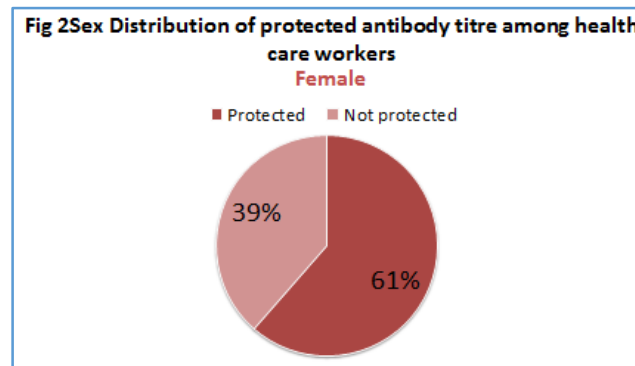


Figure 2

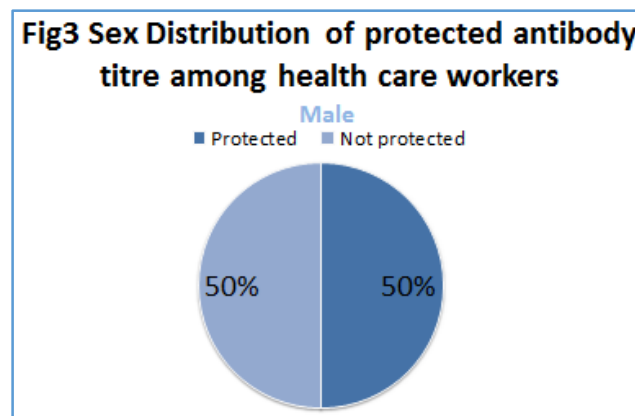


Figure 3

Occupation	Protected	Not Protected	Total N (%)
Doctors	17	4	21 (23%)
Nurses	15	11	26 (28%)
Lab Tech. and Paramedical Staff	22	23	45 (49%)

Table 1. Distribution of Protected Antibody Titre among Health Care Workers

No. of Dose of Vaccination in Primary Series and Booster	n (%)	Protected	Not Protected
1 dose	4 (4.3 %)	0 (0 %)	4 (4.3 %)
2 doses	23 (25 %)	13 (14%)	10 (11%)
3 doses without booster	42 (45.6%)	23 (25%)	19 (20.6%)

DISCUSSION

Vaccination against Hepatitis B is must for all the HCWs. WHO has estimated only 18% - 39% vaccination coverage of

Hepatitis B among HCWs of low and middle-income countries compared to 67% - 79% in high income countries. HBV vaccination is now part of national routine immunisation program for children in India. In a study done by Harsha K et al,⁸ nearly all (93.8%) of the HCWs surveyed had taken 1 dose of hepatitis B vaccine, only 57.1% completed the primary series of 3 doses and only 26.4% had taken 1 or more booster doses. This is in agreement with our study- 45.6% completed the primary series of 3 doses and only 22%) had taken the booster. In a study done by Madhumita D et al⁹ at Lady Hardinge College, Delhi, (67%) HCWs had a protective level of anti-HBsAb level which is similar to our study (59%). HCWs had a protective titre. There is sufficient evidence that the levels of anti-HBs antibody are related to the number of doses of vaccine administered. Jha AK et al¹⁰ (Delhi, 2012) and Sukriti et al⁷ (India, 2008) also reported similar findings, i.e. the percentage of HCWs who had protective level of anti-HBsAb titre after complete vaccination was 73.5% and 82.2% respectively. This is in accordance with our study which shows 80% of participants with complete vaccination with protective titre. HBV vaccination in HCWs including medical students and trainees in India is recommended, but not strictly enforced or mandatory like in United Kingdom (UK) and Spain.^{11,12}

“No responder” subjects after a vaccine series may be administered up to 3 additional doses (at 0, 1 and 6 months) for protection. Recently, for these subjects a new vaccination schedule has been proposed, which is 2 doses simultaneously in deltoid muscles followed by a similar dose after 2 months and serological testing at interval of two months. Limitations of our study are less participants, low awareness among HCWs and cost of kit.

CONCLUSION

Our study at IGIMS shows the low level of vaccination awareness among HCWs. Protective titre was seen more with complete vaccination. This study highlights the need to improve the vaccination coverage to protect the workers from acquiring hepatitis B infection. Refresher training programme should also be conducted to update the knowledge of HCWs on regular basis.

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