

# SCREENING AND INCIDENCE ANALYSIS OF HEPATITIS B VIRAL INFECTION IN A TERTIARY CARE HOSPITAL OF HEALTH CARE PROFESSIONALS, KANCHIPURAM

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**ABSTRACT:** *Viral infection like Hepatitis B is a major global health issue and also for death it is a leading cause. Therefore, our current research was performed to understand the seroprevalence of HBV infection. methods: 332 health care employees 168 were nursing personnel, 66 were laboratory technicians and 98 were paramedical staff were included. All the required information's are obtained in the form of questionnaire. All the HCW's were divided into 3 groups based on completion of vaccine schedule. Group A are those who completed full dose of vaccine and within 5 – 10 yrs group B were those who had partially completed vaccine and more than 10 yrs being vaccinated. Group c is those who never knew about vaccination and not vaccinated. Blood sample and serum separated for ELISA for Hepatitis B. Title >10 IU/ml of anti-HBs was deemed defensive. Results: Out of 332 serum samples, 152 (45.2%) were females, 182 (54.81%) were males. Among 332 HCW's 298 (89.75%) were vaccinated, with 223 (67.16%) completely vaccinated and 75 (22.59%) were partially vaccinated and 34 (10.24%) were unaware of vaccination. among the 332 HCW's 6 (1.80%) were found to be positive. Among the 223 vaccinated Hcw's, 202 (90.58%) were fully vaccinated (group A) have anti HBs titre > 10 IU/ml, protective antibody level is higher in vaccinated group than partially vaccinated group. Conclusion: This study highlights the need for the HCW to be educated, vaccinated and maintains a stringent hospital policy in order to maintain the consistency of the health care system.*

**Keywords:** *viral infection, vaccination, antibody, health care workers*

## INTRODUCTION

Viral infection like Hepatitis B is a major global health issue and also for death it is a leading cause.<sup>[1]</sup> Over 1,00,000 die annually because of the disease related with Hepatitis B infection and in India Hepatitis B carries about 40 millions<sup>[2]</sup>. Employees in health care are at higher risk of exposure to infection by percutaneous injury (e.g. needle stick, cut with sharps)<sup>[3]</sup> HBV workplace exposure rises in millions of health care personnel and it is estimated that they experience from 600,000 to 8, 00,000 cut and puncture injuries every year<sup>[4]</sup>. Since blood contains the highest HBV titres and acts as an essential mode of virus transmission in people who are not vaccinated. The illness can be spread even after a single incident of needle stick infection and even 0.00001 ml of blood<sup>[5]</sup>. The seroprevalence of HBV in health care

professionals are four times higher than the general public. While it is a transmissible virus, it is also one of the diseases preventable by full vaccination.<sup>[6]</sup>

In developing countries like India Vaccine for Hepatitis B is not fully covered due to lack of awareness, and less priority given by health care system<sup>[7]</sup>. In India 16 – 60% of HCW's (Health Care Workers) have complete HBV immunization and the knowledge of needle disposal, wearing gloves remains suboptimal among health care workers<sup>[8]</sup>.

Therefore, our current research was performed to understand the seroprevalence of HBV infection, the proportion of HCW with defensive antibody titers, and to determine the awareness of vaccination with Hepatitis B.

## MATERIALS AND METHODS

Around 332 health care employees (168 were nursing personnel, 66 were laboratory technicians and 98 were paramedical staff) who gave their permission to be included in the study were included after receiving ethical approval from the institute. A typical questionnaire consisting of age, ethnicity, work description, academic status, specifics such as HBV vaccination, needle stick injury, universal safeguards such as the use of gloves, the use of fresh syringes, hand washing procedures, blood transfusion history is required to be completed by all participants.

All the HCW's were divided into 3 groups based on completion of vaccine schedule. Group A are those who completed full dose of vaccine and within 5 – 10 yrs group B were those who had partially completed vaccine and more than 10 yrs being vaccinated. Group c are those who never knew about vaccination and not vaccinated so far.

3-5 ml of blood sample obtained under strict aseptic precaution from all participants, the serum isolated and ELISA test performed for Hepatitis B antigen (J.Mitra) identification and antiHBsAg titre (Biorad) estimate is performed as per the guidelines for manufacturing. Title >10 IU/ml of anti-HBs was deemed defensive.

All the Hepatitis B positive health care workers were subjected to treatment and antibody levels were monitored to keep in track of their health status.

## RESULTS

Out of 332 serum samples, 152 (45.2%) were females, 182 (54.81%) were males. The Table 1 showing the status of vaccination among the various groups of health care workers.

Table 1. Status of Vaccination

HCW	Group A		B		C	
	n	%	n	%	n	%
Staffs Nurses n = 168	142	42.77	20	6.02	6	1.8
Lab technicians n =66	43	12.95	12	3.61	11	3.31
Paramedical staffs n = 98	38	11.44	43	12.95	17	5.12
Total : n =332	223	67.16	75	22.59	34	10.24

Among 332 HCW's 298 (89.75%) were vaccinated, with 223 (67.16%) completely vaccinated and 75 (22.59%) were partially vaccinated and 34 (10.24%) were unaware of vaccination.

Among the 332 HCW's 6 (1.80%) were found to be positive of which 2 Hcw's were from staff nurse who belonged to groups B (Partically vaccinated) and 1 ( 0.30% ) were lab technician who belong to partially vaccination and 3 (0.90%) were paramedical (house keeping) staffs who were unaware of hepatitis B vaccination and not vaccinated at all belonging to group C.

One HCW from housekeeping and one staff Nurse had h/o needle strick injury and didn't take any post exposure measures. The Table 2 showing the level of antibody titre among vaccinated HCW's.

Table 2. The level of antibody

Vaccinated HCW's	titre > 10 IU/ml		titre < 10 IU / ml	
	n	%	n	%
group A (223)	202	90.58	21	9.41
group B (75)	24	32.01	51	68.01

Among the 223 vaccinated Hcw's, 202 (90.58%) were fully vaccinated (group A) have anti HBs titre > 10 IU/ml, protective antibody level is higher in vaccinated group than partially vaccinated group. Who are 24 (32.0%) having protective antibody titre.

Among the 332 serum samples 6 were found positive and were sent to gastroenterology department for further treatment. Group A & group B HCW's whose antibody level < 10 I U / ml were given counseling and given a complete dose of vaccination as most of them were unaware of dose & schedule of previous vaccination. Group C HCW's were given complete dose of vaccination and compulsory training regarding hand washing, wearing of PPE, biomedical waste handling and spill management. All those people were monitored for antibody titre after 1 month of completing the 3<sup>rd</sup> dose.

## DISCUSSION:

Among the high risk groups health care workers are more prone to contract Hepatitis B and are identified as risk factor for transmission because they are vulnerable to sharp injuries<sup>[9]</sup>.

In our study 332 HCW's were enrolled of which Males 182 (54.81%) were predominant in number. Among 332 HCW's 168 were nursing staffs 66 were lab technician and 98 were paramedical staffs . All HCW's were divided into 3 groups, group A fully vaccinated, group B – partially vaccinated, group C – unaware or no vaccination given.

This is far greater than the madhumitha et al<sup>[10]</sup> analysis, which recorded 56.4 percent of vaccination, among 332 HCW's 298 (89.75 percent) vaccinated. Similar analysis by Forhanasiraj et al, who reported 79.7% of the vaccinatedof HCW.<sup>[11]</sup>

In our sample, the seroprevalence of HBsAg was 1.8%, this is in accordance with the analysis conducted by Kalaskar et al D4, who reported 1% of HBsAg and Margyamdafii et,<sup>[12]</sup> who also reported 0.97% of HBsAg in their study, as well as JKA et al, who reported 1.4% in their study.

The highest positivity in housekeeping workers led by nursing staff was identified in our sample according to occupation. This is comparable to the study conducted by Maryam Defi et al<sup>[13]</sup>, who also registered maximum positivity among housekeeping workers followed by nursing staff. Askarian et al<sup>[14]</sup> and Alese et al<sup>[15]</sup> have published similar results.

In our study it was observed that 223 (67.16%) were fully vaccinate with all 3 dose and 75 (22.59%) were vaccinated with one or 2 doses and 34 (10.24%) were unaware of vaccination & not taken at all. This is much higher in a study done by Reshmi et al<sup>[16]</sup> who reported 34.62% of fully vaccinated HCW's and 7.69% of partial vaccination and 57.69% have never been vaccinated at all. Similar findings were also reported by sumitkumar& Begum et al<sup>[17]</sup> who also found 46% HCW were fully vaccinated, 12% were partially vaccinated and 41% not vaccinated in their study.

In our study among the 223 fully vaccinated HCW's, 202 (90.58%) have positive protective antibody level (>, 10 IU/ml) and among the partially vaccinated group 75 only 24 (32.01%) have

positive titre. This titre value is much higher than a study done by Madhumitha et al <sup>10</sup> who also reported 81.06% positive titre in fully vaccinated groups and 65.16% in partially vaccinated group.

Similar findings were reported by Tha AK et al <sup>[18]</sup> and Sukriti et al <sup>[19]</sup> that the positive protective level of antiHBsAg titre after full vaccination was 73.5% and 82.2%, respectively. Singhal et al <sup>[20]</sup> found that the vaccine coverage of Hcw varies between 50 and 60 percent.

In our study 34 (10.24%) Hcw's were not vaccinated at all, and this is similar to study done finding by sonali et al <sup>[21]</sup> who reported 13.1% of Hcw's not vaccinated. Hcw's were given health education & a complete immunization. Lack of awareness, lack of confidence, fear of pain, lack of time and resources are the key reasons for non-vaccination<sup>[22]</sup>. This study reveals that occupational health & safety regulation policies for compulsory vaccination & checking of antibody titre to be monitored strictly by the infection control team.

## CONCLUSION

The outcome of the current analysis indicates that 10.24 percent of HCWs have not been vaccinated and are uncertain of vaccines, considering the availability of the Hepatitis B Virus vaccine. This report highlights the need for the HCW to be educated, vaccinated and maintains a stringent hospital policy in order to maintain the consistency of the health care system.

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