



## Original Article

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

Authors

**Dr Soni Rani<sup>1</sup>, Dr Purnendu Kumar Singh<sup>2\*</sup>, Dr Arun Kumar Pandey<sup>3</sup>**

<sup>1</sup>Post graduate Trainee, <sup>2</sup>Associate Professor, <sup>3</sup>Assistant Professor

Department of Community Medicine, Katihar Medical College, Katihar, Bihar, India, 854105

\*Corresponding Author

**Dr Purnendu Kumar Singh**

Department of Community Medicine, Katihar Medical College, Katihar, Bihar, India, 854105

Email: [purnendukumars@yahoo.com](mailto:purnendukumars@yahoo.com)

## 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 world<sup>1</sup>. Hepatitis B infects nearly 2 billion people around the globe, out of which 350 million suffer from chronic, lifelong infection<sup>2</sup>. Around 15% to 40%

of the chronic HB patients are susceptible to develop liver cirrhosis and hepatocellular carcinoma<sup>3,4</sup>. 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<sup>5</sup>.

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<sup>6</sup>. Physician, dentists, nurses, laboratory staffs and other hospital staffs are at high risk of acquiring infection via contact with blood and other body fluids<sup>7</sup>. 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<sup>8</sup>. 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<sup>9</sup>. 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
	<b>Total</b>	<b>1949</b>	<b>1000</b>	<b>51.31</b>	<b>949</b>	<b>48.69</b>

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	89.38	10	8.85	11	9.73
7	Group D Staff	335	297	88.66	310	92.54	38	11.34	30	8.96
	<b>Total</b>	<b>1000</b>	<b>698</b>	<b>69.80</b>	<b>580</b>	<b>58.00</b>	<b>158</b>	<b>15.80</b>	<b>223</b>	<b>22.30</b>

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
<b>Total</b>	<b>1949</b>	<b>69.32</b>	<b>78.09</b>	<b>82.81</b>	<b>65.78</b>	<b>44.07</b>	<b>25.71</b>	<b>21.75</b>

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.	%
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

$\chi^2 = 787.91, df=6, p<.0001$

\*Pooled together for Chi- Squire 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<sup>10</sup> 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)<sup>11</sup>. 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<sup>12</sup>, Singh and Jain, 2001<sup>10</sup>). 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)<sup>12,13</sup>.

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<sup>14</sup>, 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.

### Acknowledgement

Authors thank all health care workers who participated in this study. Authors thank the honourable Managing Director Dr. Ahmad Ashfaq Karim Sir for his continuous encouragement for research activities. Authors also thank all faculty members of Department Of Community Medicine for their kind support and valuable suggestions for preparing this manuscript.

### Reference

1. Maddrey WC. Hepatitis B: an important public health issue. *J Med Virol* 2000; 61(3):362–6.
2. World Health Organization. *Hepatitis B. Fact Sheet No: 204*. Available at: <http://www.who.int/mediacentre/factsheets/fs204/en> (last accessed on October 15, 2015).
3. Lok AS, McMahon BJ. Chronic hepatitis B. *Hepatology* 2007; 45(2): 507–39.
4. Lee WM. Hepatitis B virus infection. *N Engl J Med* 1997; 337(24):1733–45.
5. Puri P. Tackling the Hepatitis B Disease Burden in India. *J Clin Exp Hepatol*. 2014 Dec;4(4):312-9.
6. Afihene MY, Duduyemi BM, Hannah-Lisa AT, Khatib M. Knowledge, attitude and practices concerning Hepatitis B infection, among healthcare workers in Bantama, Ghana: a cross sectional study. *Int J Community Med Public Health*. 2015; 2(3):244-53.
7. Kermode M, Holmes W, Langkham B, Thomas MS, Gifford S. HIV-related knowledge, attitudes and risk perception amongst nurses, doctors and other healthcare workers in rural India. *Indian J Med Res* 2005;122(3):258–64.
8. Nagao Y, Matsuoka H, Kawaguchi T, Ide T, Sata M. HBV and HCV infection in Japanese dental care workers. *Int J Mol Med* 2008; 21(6):791–9.
9. Razi A, Rehman R, Naz S, Ghafoor F, Ullah MA. Knowledge attitude and practices of university students regarding hepatitis B and C. *ARPN J Agric Biol Sci* 2010;5(4):38–43.
10. Singh A, Jain S. Prevention of hepatitis B - Knowledge and practices among medical students. *Healthline* 2(2): 8-11. 2011.
11. Younis BB, Khan GM, Akhtar P, Chaudhary MA. Vaccination against hepatitis B among doctor at a teaching

- hospital at Lahore. Pak J Med Sci 17: 229-232. 2001.
12. Raza W, Tariq W, Zafar Z, Ali I. Khar MU, Khurram M. Knowledge, attitude and practices (KAP) of medical students towards Hepatitis B and C. Ann Pak Inst Med Sci 4(2):116-120.2008.
  13. Samuel SO, Aderibigbe SA, Salami TAT, Babatunde OA. Health workers' knowledge, attitude and behavior towards hepatitis B infection in Southern Nigeria. International Journal of Medicine and Medical Sciences 1(10): 418-424. 2009.
  14. Setia S, Gambhir RS, Kapoor V, Jindal G, Garg S. Attitudes and Awareness Regarding Hepatitis B and Hepatitis C amongst Health-care Workers of a Tertiary Hospital in India. Ann Med Health Sci Res. 2013;3(4):551-8.