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Original Research Article

Level of Awareness Regarding Hepatitis B Virus and Its Vaccination among Medical Students and Importance of Early Clinical Exposure (ECE) as Per New Undergraduate Curriculum

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Abstract:

Background: Hepatitis B virus (HBV) infection is potentially life-threating and can produce health hazard to all groups of healthcare workers including medical students. However, the level of awareness regarding HBV and its vaccination is lacking among the medical students.

Methods: A cross - sectional study was conducted in a medical college attached to a tertiary care hospital. A total of 400 medical students belonging to 1st year, 2nd year, 3rd year and 4th year were evaluated using a self-structured questionnaire to assess the knowledge and awareness about HBV and the status of hepatitis B vaccination. Among the students who participated the 1st year to 3rd year students of MBBS batches had undergone medical training as per the new CBME based curriculum, however the final year students were trained as per the old MBBS curriculum.

Result: There was significant improvement in the knowledge component of students after the introduction of CBME based curriculum from 2019 onwards. Highest level of awareness was observed among the 3rd year students followed by 2nd year. However, the level of awareness was comparatively low among the students of 1st year and 4th year.

Conclusion: The Level of Awareness regarding HBV, its vaccination and management of NSI was comparatively low among medical students. The hospital should make a mandatory policy for strict implementation of vaccination and safe injection practice for all the medical and allied subjects at the commencement of their courses.

Keywords: Hepatitis B Virus, Hepatitis B vaccine, anti- HBs titre, medical students.

Introduction

Hepatitis B Virus (HBV) is one of the major health hazards globally effecting large number of people.[1] World health organization (WHO) has undertaken an initiative to eliminate HBV infection by 2030. [2] HBV belongs to hepadnaviridae family and is partially ds DNA virus.[3]

HBV is the only vaccine-preventable virus transmitted from one person to the other by via multiple routes such as parenteral route by handling blood and blood products, sexual route and from mother to child through vertical transmission.[2,4]

HBV infection is slow and insidious in onset and primarily affects liver and can cause fulminant hepatitis, cirrhosis and hepatocellular carcinoma in complicated cases.[3] As it is a vaccine preventable infection, there is an urgent need for strict implementation of vaccination and education on safe injection practice among health care workers (HCWs) across India. Hepatitis B vaccination program was initially launched in June 2002 in India and then its use was further expanded in 10 states of the country in 2007-08 and entire country is being covered since 2009. [5] Although hepatitis B vaccinations has been integrated in the Universal Immunization Program (UIP), according to the data, 45% of the children aged 12–59 months were not vaccinated against hepatitis B in India.[5]

Though, the knowledge of HBV transmission and prevention is must know for all groups of HCWs including medical student, a large number of students are neither vaccinated and many are unaware of their vaccination status, thus making them vulnerable to blood borne infections.[6]

This study was planned to assess the level of knowledge about hepatitis B infection and its vaccination among medical students belonging to different professional year of their course and to educate those who are unaware. Simultaneously this study also aims to evaluate the beneficial outcome of early clinical exposure (ECE) of the students of MBBS as per new Competency Based Medical Education (CBME) curriculum reforms.[7]

Methods

A cross sectional study was carried out among the MBBS students of a private Medical College attached to a tertiary care hospital in Meerut, Uttar Pradesh, India. The approval from Institutional Ethics Committee was taken before starting the study.

A self-structured questionnaire containing a set of questions assessing basic knowledge about HBV infection, its modes of transmission, diagnosis, risk behaviours, prevention, treatment, and its vaccination was distributed to all 400 students. Among the participants 100 students were 1st year medical students (MBBS 2021 batch) who had just entered the college , 100 students each belonged to 2nd & 3rd year respectively (MBBS 2020 & MBBS 2019 batches) who had undergone training as per new CBME based curriculum.[7] The 100 final year medical students (MBBS 2018 batch) followed the old MBBS curriculum . Students of both the genders participated in this study.

The students were explained about the objective of the study. The participation of students was voluntary and verbal consent was obtained from them. There were total of 23 questions (Tables 1). The time allotted for the questionnaire was 25 minutes, approximately 1 min/question. The same questionnaire was given to all the group of students. The data was analysed and compared.

Results

All the students participated in the study answering the questionnaire thus giving a response rate of 100%. The participants were between the age group of 18 to 24 years. Amongst the total participants, there was female predominance (53%) with a female: male ratio of 1:1.12. Comparison of correct responses given by medical students regarding HBV and its vaccination is given in Table 1. There was a significant difference in the level of knowledge among the all the study groups. The response of MBBS 3rd year (the first CBME batch) was taken as benchmark in this study to compare the level of awareness.

It was noted that the overall correct response rate was much higher in MBBS 3rd year students as compared to students of MBBS 1st, 2nd, & 4th year. Generally, the level of awareness regarding the HBV, its mode of transmission, the clinical symptoms, and hepatitis B vaccination schedule, its dosing and general concept of non-responders was more among the 3rd year students as compared to others and least in 1st year. The difference between the groups was found to be statistically significant.

However, the awareness regarding Needle stick injury (NSI) its management and protective antibody titre was best among the 4th year students followed by 3rd, 2nd & 1st year students.

Finding out on how the students had knowledge about HBV infection and it's vaccination, protective titre and post exposure prophylaxis, majority of the students (90%) answered that they got the awareness through medical training that is by the classes conducted by Department of Microbiology and Hospital infection control team in 1st year as part of foundation course and ECE and it was subsequently reemphasized in second year posting in Microbiology. Few students said that they got awareness also from internet contents and awareness programmes.

Table 1: Comparison of correct responses given by medical students regarding HBV and its vaccination

Questions	Answers	Ist year	2nd year	3rd year	4th year	P Value Ist	p value-IInd	p value-IVth
GENDER	Male	50.3	45	53.1	37.8			
	Female	49.7	55	46.9	62.2			
Which category do you belong?	Medical Student	100	100	100	100			
1. Are you aware about Hepatitis B virus vaccination? *	Yes	92.7	91	92.9	100	0.9601	0.624	0.00672
2. Have you received Hepatitis B	Yes	53.1	19	89.2	47.7	<0.00001	0.00001	<0.0000

vaccination? *								1
3. Have you received all three doses of hepatitis B vaccination? *	Yes	36.7	8	70.3	29.1	<0.00001	0.00001	<0.00001
4. Have you received single or two doses of hepatitis B vaccination?	Completed the doses schedule	31.6	5	70.3	23.8	<0.00001	0.00001	<0.00001
5. Have you ever received a booster dose of hepatitis B in last 5 years? *	YES	15.3	6	32.4	9.9	<0.00001	0.00001	<0.00001
6. Hepatitis B is transmitted by the following *	Sexual transmission	92	84.1	96	87.9	0.23404	0.00496	0.03486
	Blood transfusion	93	82.1	96.9	89	0.20766	0.00064	0.02926
	Needle Stick Injury(NSI)	88	70.2	95.9	87	0.04036	<0.00001	0.0244
	From infected mother to her child during delivery	73	64.9	86.5	75	0.01732	0.00004	0.0394
	By breast feeding	34.7	27	37.1	80	0.72634	0.12602	<0.00001
	By sharing razor, toothbrush of infected person	49	40.5	62.2	48	0.0601	0.00214	0.04338
	By coming in contact with infected open skin lesions	45.9	36.4	49	35.37	0.05118	0.07186	0.05118
7. Chances of transmission of HBV infection after getting exposed to contaminated needle prick injury is ? *	30%	41.7	21.6	53	39.6	<0.00001	<0.00001	<0.00001
8. Hepatitis B virus infection causes? *	Cirrhosis	74.2	61	81.1	97		0.00174	
	Liver Cancer							
	Autoimmune disease like glomerulonephritis, arthritis					0.242		0.00032
	Jaundice, nausea and vomiting							
9. Is Hepatitis B vaccination programme included under the National Immunization Schedule? *	Yes	89	88.7	91.9	80	0.48392	0.44726	0.01552
10. How many dosage of vaccination is recommended? *	3	74.4	44	89.6	40	0.00256	<0.00001	<0.00001
11. Do you think booster dose is required after getting fully vaccinated? *	NO	15.2	12.5	20	16.8	0.1867	0.0749	0.28076

12. In case of partial vaccination, what should be done? *	Look for antibody titer	30.6	25	35.1	53.8	0.2482	0.05938	0.00391
13. If a HCW gets exposed to occupational injury through a patient whose Hepatitis B status is unknown then he/she should do what ? *	Take first aid- Report to designated nodal center within 2 to 72 hours- Try to get report of source status- Take first dose of PEP (HBIG)	28	24.3	32.5	21.67	0.2451	0.09853	0.0427
14. Have you ever been exposed to Hepatitis B infection via any kind of occupational exposure? *	NO	87.4	93	83.8	76.5	0.2327	0.02118	0.09853
15. If you have taken 3 doses of vaccines but accidentally gets exposed to NSI from Hepatitis B positive patients then you need to take? *	Firstly we will check our antibody titer	69.2	43	78	96.54	0.0792	<0.00001	0.00004
16. Route of Hepatitis B vaccination is? *	Intramuscular	82.6	35.4	89.2	85	0.9012	<0.00001	0.18673
17. What is the recommended schedule of Hepatitis B vaccination for adults? *	0,1,6 Months	72.6	43	88.5	40	0.002	<0.00001	<0.00001
18. What can one do if he/she forgets about his/her Hepatitis B vaccination status? *	Take revaccination if antibody titer remain<10m IU/ml	53	45.7	60.2	67.6	0.1515	0.02018	0.1378
19. Who is a non-responder? *	Person shows no seroconversion that is (titer < 10mIU/ml) even after taking six doses of vaccine.	71.2	43	78.9	73.5	0.1038	<0.00001	0.18406
20. Is it important to identify non – responders? *	YES	87.4	58.9	91.8	97.3	0.15386	0.15386	0.04363
21. General prophylactic measures can be taken to avoid Hepatitis B infection? *	Screening of blood bags	69.9	55	70.4	67.8			
	following safe sex protection and providing good health education	92	88	98	98.4			
	following safe injection and aseptic surgical practice following hand hygiene	84.3	79	88.5	82.4			
	All of the above	72	54	95	100	<0.00001	<0.00001	0.02382

22. If a partially vaccinated person gets exposed to occupational injury, for diagnosis of hepatitis B infection which viral marker should be checked first? *	Hbs-Ag + Anti-Hbs antibody titer	29	49.8	58	76.5	0.12302	<0.00001	0.00264
23. How did you come to know about Hepatitis B virus infection and its vaccination?	Medical training	78	58	89.8	98	0.0116	<0.00001	0.04036

Discussion

HBV infection is a vaccine-preventable disease. Although an efficient vaccine was available since 1982, the HBV vaccine was introduced in India in a phased manner from the year 2002 and was included under the National Immunization Program of India in the year 2011 to cover the whole country.[8] The undergraduate medical students are at increased risk of exposure to blood borne viruses (BBV) due to handling and care of patients in routine clinical posting and demonstration classes.

Previous research had noted that the infection rates of HBV and other BBVs among healthcare workers are almost double when compared with the national prevalence.[9]

Our study also compared the level of awareness of students enrolled in the first CBME based curriculum with students enrolled earlier with non-CBME based curriculum and subsequent junior batches. Overall the level of awareness about the virus, its modes of transmission was good among the students of 3rd year as compared to students of other academic years where significant lack of knowledge was observed. Several studies in other countries too have revealed similar lack of knowledge among medical students.[10-13,14,15]

This maybe because 3rd year was the FIRST CBME batch enrolled in the curriculum after NMC made the CME based curriculum mandatory in all the medical colleges across India from 2019.

This batch being the first, got more attention in terms of the new methodology of teaching not only the theoretical aspect but were also taught the clinical relevance (ECE) with an integrated approach of teaching right from the foundation course which led to more emphasis in topics like infection control practices, biomedical waste management, standard precautions including management of NSI. Teaching the medical students, the good standard practices right from infancy of their medical education was fruitful as they were young, easy to mould and enthusiastic, definitely showing the beneficial outcome of this new education system.

Our study also revealed that though a significant percentage of medical students were vaccinated for HBV; about 20% students were not sure about their vaccination status (lack of complete knowledge) thus making them vulnerable to infection on exposure. Similar finding of lack of complete knowledge among medical students has been reported by Sannathimmappa, et al.[16] Though, a total of 80% of our students were aware about HBV vaccine including its dose, route of administration and regime according to the national immunization schedule of India.

Many of our students were also not sure if this vaccine provided lifetime protection or it required a booster. Similar finding has been reported.[17] However, the knowledge of NSI and its management was best among the final year medical students with approximately 90% correct answers.

This can be attributed to the fact that MBBS final year students are more prone of getting NSI and hence, were well aware about the concept of NSI and its management. Similar finding was observed by Kandi et al. [17]

The present study highlights a very important issue that in spite of knowing HBV as a vaccine preventable BBV infection, still a significant percentage of medical students are unaware and ignorant about it thus making them vulnerable to the infection.

Conclusion

Overall, the level of awareness regarding HBV, its vaccination and management of NSI was comparatively low among medical students.

We recommend that every hospital and medical colleges should have a mandatory policy to vaccinate all the undergraduate, post graduate, dental, nursing and paramedical students irrespective of their vaccination status at the commencement of their course and monitor their

post vaccination antibody titre in those individuals who have taken full course of vaccination so that they are safe.

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