Original Article

Knowledge, attitude, and practice study on hepatitis B among medical and nursing undergraduate students of an apex healthcare institute at Uttarakhand foothills: A descriptive analysis

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Abstract

Background: Viral hepatitis is preventable, yet a global health priority. As hepatitis B (Hep B) remains an occupational risk for healthcare workers (HCWs), the Government of India recently mandated universal adult Hep B vaccination for all HCWs. However, in the absence of institutional policy, its real-time utilization in a hospital was dependent on individual's general awareness. Therefore, this study was designed to assess baseline knowledge, attitude, and practices among undergraduate medical and nursing students, the future HCWs, regarding Hep B at an apex healthcare institute at Uttarakhand. **Materials and Methods:** A descriptive survey was carried out using self-administered questionnaire among undergraduate medical and nursing students of a medical college between July and September 2018. Statistical Package for Social Sciences (SPSS Ver 22.0) was used for analysis. **Results:** The study comprised 180 medical and 183 nursing students. About 55.0% of medical and 33.9% of nursing students were correctly aware about the disease; 98.3% of medical and 86.9% of nursing students were aware about vaccine. About 80.6% of medical and 87.4% of nursing students showed positive attitude, recognizing disease as a public health problem. However, only 82.8% of medical and 70.0% of nursing students underwent vaccination; mere 62.4% and 49.2% of vaccinated completed three-dose vaccination schedule, respectively. Furthermore, around 7% of them checked their titer post vaccination. **Conclusion:** Despite comparatively low awareness level about the disease, most students had sufficiently high knowledge about vaccine and underwent vaccination. However, only half of them could complete three-dose vaccination schedule. Only a handful of subjects underwent post-vaccination titer assessment, an instrumental approach to safeguard them against accidental Hep B exposure.

Keywords: Hepatitis B, immunization, medical college, prevention, titer assessment

Introduction

Viral hepatitis is a preventable disease, yet a global health priority. In 2015, viral hepatitis alone caused 1.34 million deaths and is still increasing over time. Globally, in 2015, estimated hepatitis B (Hep B) prevalence in general population was 3.5% with about 257 million people living with chronic Hep B.[1] India, falling within intermediate Hep B endemicity zone, is world's second largest pool for chronic Hep B with 2%–8% Hep B surface antigen (HBsAg) positivity and more than 50 million cases.[2]

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Despite implementation of best infection control practices including provision of an effective vaccine, Hep B infection remains a well-recognized occupational risk for healthcare workers (HCWs).[3] Indian reports indicate that only 16%–60% of HCWs receive complete Hep B immunization. Paramedics receive vaccination far less often than doctors, thus at higher risk of Hep B transmission.[4] An HCW has four times greater probability of contracting Hep B compared with general population, with 6%–30% risk of acquiring Hep B post-single exposure in an unvaccinated person.[5,6] About 14.4% of Hep B infection rates are reported in HCWs with highest prevalence among dentists, nursing staff, dialysis unit staff, laboratory staff, or physicians.[7] These HCWs are mostly unaware of their potential exposures to contaminated sources. Even when exposures are recognized, HCWs often do not seek post-exposure prophylactic management.[4] Reported attributable Hep B among percutaneous injuries is 40%–65% in developing countries, in contrast to <10% in developed countries.[8] As far as overall Hep B prevalence among Indian HCWs is concerned, it reportedly ranges from 2.21% (1998) to 1% (2008).[9-11]

In this regard, Government of India (GoI) has been taking many initiatives to prevent Hep B. It covers mandatory Hep B vaccination for under-five children under Universal Immunization Programme (UIP) including timely birth dose, use of auto disposable syringes for vaccination, safety of blood and blood products, and proper disposal of biomedical waste (BMW).[4] In June 2018, GoI further mandated compulsory vaccination for all HCWs under National Viral Hepatitis Control Program (NVHCP) in coordination with UIP, who have not received a complete primary series before. This involves administration of total three Hep B doses within 1–6 months as per adult Hep B immunization schedule.[4,12] A month later, all vaccinated must undergo obligatory titer assessment for protective Hep B antibody levels (anti HBs >10 IU/mL) to ensure presence of immunity and subsequent need of booster.[12] Other than conventional HCWs, NVHCP extends benefits to even those involved in conducting deliveries, giving injections, exposure to blood or blood products directly or indirectly, and so on.[12]

Needless to affirm that today's undergraduates, undergoing health training, are tomorrow's HCWs. Hence, they will be at an extended occupational risk to pick Hep B infection in future. Thus, to ensure effective implementation of the above-mentioned guidelines, prior identification of their baseline awareness is of paramount importance. It is pertinent to highlight here that during the conduction of this study, that is, prior to November 2018, the establishment has neither mandated universal adult Hep B vaccination for its HCWs nor there existed any institutional policy on obligatory post-vaccination anti-HB titer assessment as per GoI recent guidelines. The institute provided state-of-art facility only for provisional adult Hep B vaccination at chargeable rates borne by an individual volunteered for vaccination. Expectedly, its real-time utilization was based on their general awareness and attitude toward the disease. Keeping above background in mind, this study was designed to assess baseline knowledge, attitude, and practices among undergraduate medical and nursing students regarding Hep B at an apex healthcare teaching institute of Rishikesh, Uttarakhand (India).

Materials and Methods

Study design and participants

A descriptive survey was carried out among undergraduate medical and nursing students by the Department of Community and Family Medicine at an apex healthcare teaching institute of Rishikesh, Uttarakhand (India). Established as one of the apex healthcare institutes by GoI 7 years ago, the establishment provides one of its finest infrastructure and facilities, promoting excellence in learning and research among students. Pertaining to Hep B–related services, the institute uses mandatory Hep B vaccination for under-five children including timely birth dose and consecutive universal Hep B screening for its fresh recruits during pre-employment medical examination during their joining. In addition, the administration also conducts regular training for students/HCWs on universal precautions, BMW management, and prevention of needle stick injury (NSI).

The study population included all students reporting to lecture hall of study setting during the planned session. A total of 580 students were pursuing undergraduate medical (n = 400) and nursing (n = 180) training in the institute at the time of initiation of the study. Assuming an awareness level of 50% among HCWs, with 80% power, 95% confidence level, and 10% of admissible error, a minimum of 125 medical and nursing students each were required to be recruited in the study. Data were collected over a period of 3 months between July and October 2018.

Study variables and instruments

Institutional ethical committee clearance (*IEC No: 96/IEC/STS/2018*) was obtained prior to initiation of the study. Prior permission from Dean/Principal of study subjects was also sought. Written informed consent was obtained from all participants prior to data collection. A complete list of presently enrolled medical and nursing students was formerly retrieved from records prior to data collection.

On the day of data collection, subjects fulfilling the inclusion criteria were identified from records. Using systematic random sampling technique, subjects selected from the given list were enrolled in the study after obtaining written informed consent. In case the student denied or was absent during the session, the next student with adjacent roll number was recruited.

Data were collected by self-administered pretested questionnaire. The questionnaire included details on knowledge, attitude, and practices pertaining to Hep B. The first part of the questionnaire assessed regarding correct knowledge about Hep B (*operationally defined as viral disease of liver pathology caused by Hep B virus (HBV)*), its transmission, and available prevention strategies. The second part of the survey included questions on attitude pertaining to mandatory screening for high-risk group (HRG), vaccination, and

other preventive measures like following standard protocol for BMW management. The last part covered assessed their real-time practice especially with respect to vaccination.

Statistical analysis

The above data were analyzed using Statistical Package for the Social Sciences (SPSS) version 23.0. The results were expressed as percentages and proportions for categorical variables. Continuous data were described as mean with standard deviation (SD) or as median with interquartile range. Chi-square test or Fisher Exact test and Student's *t*-test were used to compare proportion and mean, respectively, in two groups. Fisher's exact test was used when needed. $P < 0.05$ was considered statistically significant.

Results

A total of 363 candidates were recruited in the study. Among them, 180 were medical candidates, while the remaining 183 were nursing students. The mean (±SD) age of enrolled subjects was 21 years (±5.7 years). Most medical students (88.9%) belonged to comparatively older age group (21–25 years) than nursing students (25.1%). More than two-thirds of medical candidates (67.2%) were males, whereas all nursing students (100.0%) were females.

Knowledge on Hep B among study participants

Table 1 describes baseline knowledge of study participants on different aspects of Hep B. Visibly, more than half of medical students (55.0%) were correctly aware about the disease compared with one-third of nursing students (33.88%) ($P < 0.001$). More than half of medical subjects were aware about both screening and diagnostic tests (75.6% vs 64.5%) for Hep B in contrast to nursing students (47.5% vs 4.4%). Over 90% of nursing students (94.5%) had correct knowledge regarding compulsory notification of Hep B than medical candidates (77.2%) ($P < 0.001$). High proportion of medical and nursing candidates identified HCWs as an HRG,

Table 1: Baseline knowledge of study participants on various aspects of hepatitis B (*n*=363)

Variable	Medical students (*n*=180) *n* (%)	Nursing students (*n*=183) *n* (%)	Total (*n*=363) *n* (%)	*P* value[#]
What is hepatitis B				
Identified as viral disease only	71 (39.5)	51 (27.8)	122 (33.6)	<0.001
Identified as liver pathology only	4 (2.2)	25 (13.7)	29 (8.0)	
Both	99 (55.0)	62 (33.9)	161 (44.4)	
Don't know	0 (0.0)	3 (1.6)	3 (0.8)	
Incorrectly defined	6 (3.3)	42 (23.0)	48 (13.2)	
Screening test[±]				
Correctly answered	136 (75.6)	87 (47.5)	223 (61.4)	<0.001
Incorrectly answered	38 (21.1)	41 (22.4)	79 (21.8)	
Not answered	6 (3.3)	55 (30.1)	61 (16.8)	
Diagnostic test[£]				
Correctly answered	116 (64.5)	8 (4.4)	124 (34.2)	<0.001
Incorrectly answered	47 (26.1)	91 (49.7)	138 (38.0)	
Not answered	17 (9.4)	84 (45.9)	101 (27.8)	
Compulsory notification of hepatitis B				
Yes	139 (77.2)	173 (94.5)	312 (86.0)	<0.001
No	32 (17.8)	1 (0.6)	33 (9.1)	
Don't know	1 (0.6)	0 (0.0)	1 (0.2)	
Not answered	8 (4.4)	9 (4.9)	17 (4.7)	
Healthcare worker as a high-risk group				
Yes	177 (98.3)	151 (82.5)	328 (90.4)	<0.001
No	2 (1.1)	13 (7.1)	15 (4.1)	
Not answered	1 (0.6)	19 (10.4)	20 (5.5)	
Mandatory screening of blood for hepatitis B at blood banks				
Yes	178 (98.8)	151 (82.5)	329 (90.6)	<0.001
No	1 (0.6)	13 (7.1)	14 (3.9)	
Not answered	1 (0.6)	19 (10.4)	20 (5.5)	
Immunization as the best method to eliminate hepatitis B				
Correctly answered	122 (67.8)	84 (45.9)	206 (56.7)	<0.001
Incorrectly answered	51 (28.3)	51 (27.9)	102 (28.1)	
Not answered	7 (3.9)	42 (23.0)	49 (13.5)	
Don't know	0 (0.0)	6 (3.2)	6 (1.7)	
Availability of a vaccine for hepatitis B				
Yes	177 (98.3)	159 (86.9)	336 (92.6)	<0.001
No	3 (1.7)	9 (4.9)	12 (3.3)	
Not answered	0 (0.0)	15 (8.2)	15 (4.1)	

[±]HBsAg [£]HBV-DNA test, [#]*P* value calculated either by chi-square or fisher exact test

with mandatory screening at blood banks ($P < 0.001$). More than two-thirds of medical (67.8%) subjects could correctly identify immunization as best method to eliminate Hep B compared with less than half of nursing students (45.9%) ($P < 0.001$). Most medical (98.3%) and nursing (86.9%) students were aware about available Hep B vaccine ($P < 0.001$) [Table 1].

Among subjects who were aware about the availability of Hep B vaccine ($N = 336$), less than three-fourth of medical (74.6%) and nursing students (69.2%) had correct knowledge about the required three doses in adults. However, 55.9% of medical and 34.6% of nursing students were aware about its correct vaccination timing in adults, that is, at 0, 1, and 6 months. More than 80% of medical (93.8%) and nursing subjects (83.0%) were aware of provision of vaccine under UIP for under-five children. However, less than three-fourth of medical candidates (73.4%) were aware about the required four doses (including birth dose) for under-five children under program compared with less than half of nursing students (47.17%). In addition, only 40.7% of medical and 20.8% of nursing candidates were aware about its correct vaccination timing at birth, 6, 10, and 14 weeks as per the program.

The relative proportion of medical and nursing students identified screening of blood for Hep B at blood banks (59.4% vs 26.2%), vaccination (57.2% vs 30.1%), use of barrier methods (36.1% vs 13.7%), and using universal health precautions (27.8% vs 29.5%) as one of the most common methods to prevent Hep B transmission. Most medical students identified interferon (30.6%), tenofovir (23.3%), and lamivudine (21.1%) as common drugs to treat Hep B. Whereas tenofovir (9.93%) and lamivudine (7.1%) were mostly reported by nursing students.

Attitude on study participants toward Hep B

Table 2 shows that more than three-fourths of medical and nursing students identified Hep B as a public health problem in India ($P = 0.001$) and the need for subsequent booster dose ($P < 0.001$). A comparatively higher proportion of medical students (83.9%) identified the need for post-vaccination antibody titer assessment compared with less than two-third of nursing students (62.3%). Around 90% of subjects exhibited positive attitude toward compulsory vaccination of HCWs against Hep B ($P = 0.047$); necessary screening of HCWs ($P = 0.015$), family relatives of infected Hep B patients ($P = 007$), and pregnant women ($P = 0.018$); launch of national program to eliminate Hep B ($P = 0.111$); provision of standard protocols for BMW management ($P = 0.137$); and mandatory NSI reporting ($P = 0.004$) invariably in both groups [Table 2].

Practice of study participants on Hep B

Table 3 shows that comparatively higher proportion of medical (82.8%) students underwent Hep B vaccination than nursing students (70.0%) ($P = 0.001193$). Among vaccinated ($N = 277$), less than two-thirds of medical students (62.4%) could complete their Hep B vaccination with its third dose compared with less than half of nursing students (49.2%). However, less than 7% of vaccinated subjects in both the groups got their titer checked after vaccination. More than two-third of the total vaccinated (67.5%) did not provide any specific reason for not being able to get their timely titer checked post vaccination.

It can be further inferred from Table 3 that around 80% of medical (83.3%) and nursing students (79.8%) reported wearing gloves before handling patients ($P < 0.001$). Around one-third of subjects accepted that they have come in direct contact with blood/body fluids ($P < 0.001$). Among them exposed to blood/body fluids ($N = 114$), more than 85% of MBBS (86.8%) and nursing subjects (100.0%) performed post-exposure handwashing with soap and water. Visibly, a majority of medical and nursing candidates reported that they followed universal precautions, BMW management rules while handling and disposing needles, respectively. Less than one-fourth of medical (20.0%) and nursing candidates (26.2%) suffered/witnessed a NSI.

Among those who suffered/witnessed NSI ($N = 84$), a high proportion of injured medical and nursing students subjected patient (or source) to HBsAg (66.7% vs 83.3%) and HBsAg testing (66.7% vs 70.8%). Less than 90% of injured MBBS (88.9%) and nursing students (89.6%) followed proper protocol for handwashing after exposure. A comparatively higher proportion of wounded medical students (94.5%) washed punctured site with soap and water than nursing candidates (83.3%). More than half of injured nursing respondents (62.5%) did not squeeze the punctured site in contrast to less than half of medical subjects (44.4%). More than three-fourths of injured medical (77.8%) and nursing candidates (87.5%) reported NSI to the concerned health facility. About 75.0% of nursing students assessed their titer compared with 61.1% of medical students. Among them ($N = 58$), more than 80% of medical and nursing students reported normal titers and took immunoglobulin. Around three-fourth of medical (72.72%) and nursing candidates (75.0%) took booster dose at least once during their lifetime.

Discussion

The above study findings were similar to the works of Paul *et al.* (2015) in a similar cross-sectional study carried out among medical and dental students of a medical college in Chennai.[13] A study revealed that most dental (91.2%) and medical students (100.0%) had heard of Hep B. About 92.4% of medical and 87.3% of dental respondents agreed that disease is caused by a virus. Only half of medical (53.5%) and dental (47.1%) could identify HBsAg as its screening test. Around 90% of medical (96.5%) and dental (89.2%) subjects believed that disease is preventable. A higher proportion of medical students (98.6%) were aware about the available vaccine compared with dental candidates (68.6%). Around 81.7% of respondents agreed that both adults and children

Table 2: Attitude of study participants on various aspects of hepatitis B (*n*=363)

Positive attitude	Medical students (*n*=180), *n* (%)	Nursing students (*n*=183), *n* (%)	Total (*n*=363), *n* (%)	*P* value#
Hepatitis B as a public problem in India				
Yes	145 (80.6)	160 (87.4)	305 (84.0)	<0.001
No	35 (19.4)	17 (9.3)	52 (14.3)	
Not answered	0 (0.0)	6 (3.3)	6 (1.7)	
Compulsory hepatitis B vaccination among healthcare workers				
Yes	175 (97.2)	173 (94.5)	348 (95.9)	0.047
No	5 (2.8)	4 (2.2)	9 (2.5)	
Not answered	0 (0.0)	6 (3.3)	6 (1.6)	
Requirement of booster dose				
Yes	155 (86.1)	140 (76.5)	295 (81.3)	<0.001
No	21 (11.7)	20 (10.9)	41 (11.3)	
Not answered	4 (2.2)	23 (12.6)	27 (7.4)	
Need for antibody titer assessment post vaccination				
Yes	151 (83.9)	114 (62.3)	265 (73.0)	<0.001
No	27 (15.0)	27 (14.8)	54 (14.9)	
Not answered	2 (1.1)	42 (22.9)	44 (12.1)	
Screening of healthcare workers				
Yes	175 (97.2)	173 (94.5)	348 (95.9)	0.015
No	3 (1.7)	0 (0.0)	3 (0.8)	
Not answered	2 (1.1)	10 (5.5)	12 (3.3)	
Screening of family relatives of infected hepatitis B patients				
Yes	161 (89.4)	168 (91.8)	329 (90.6)	0.008
No	19 (10.6)	9 (4.9)	28 (7.7)	
Not answered	0 (0.0)	6 (3.3)	6 (1.7)	
Screening of pregnant women				
Yes	177 (98.3)	175 (95.6)	352 (97.0)	0.018
No	3 (1.7)	1 (0.6)	4 (1.1)	
Not answered	0 (0.0)	7 (3.8)	7 (1.9)	
Need to launch a national program to eliminate hepatitis B				
Yes	166 (92.2)	173 (94.5)	339 (93.4)	0.111
No	11 (6.1)	4 (2.2)	15 (4.1)	
Not answered	3 (1.7)	6 (3.3)	9 (2.5)	
Need on necessary standard protocols for biomedical waste management				
Yes	178 (98.9)	177 (96.7)	355 (97.8)	0.137
No	2 (1.1)	2 (1.1)	4 (1.1)	
Not answered	0 (0.0)	4 (2.2)	4 (1.1)	
Need to report needle stick injury				
Yes	176 (97.8)	176 (96.2)	352 (97.0)	0.004
No	4 (2.2)	0 (0.0)	4 (1.1)	
Not answered	0 (0.0)	7 (3.8)	7 (1.9)	

#*P* value calculated either by chi-square or fisher exact test

should be vaccinated against Hep B. Knowledge about disease transmission through blood transfusion (23.2%), exposure to infected body fluids (24%), contaminated needles (14.2%), infected blades (3.7%), and vertical transmission from mother to child (8.5%) were much below the expected levels. Surprisingly, some students exposed their lack of knowledge by mentioning coughing, shaking hands with infected persons, and eating food prepared by infected persons also as routes of transmission. About 73.6% of respondents were completely vaccinated against Hep B infection. Around 99.3% of medical and 37.3% of dental students had completed its three doses of Hep B vaccination.[13]

Another cross-sectional study carried out by Baig *et al.* (2015) among clinicians and medical students of Rajasthan revealed that almost all respondents (99.0%) identified Hep B as a viral disease of liver pathology. Most subjects (92.4%) were aware of the availability of vaccine; 80.2% had correct knowledge of its adult vaccination schedule. The study also revealed varied proportion of subjects identifying use of unsterilized syringes, needles, surgical instruments (96.3%), contaminated blood and blood products (97.2%), blades and piercing tools (92.4%), unsafe sex (77.7%), mother to child transmission (85.3%), and contaminated water or food prepared by infected patients (35.9%) as common routes of disease transmission.[14] Approximately 79.2% of its respondents had positive attitude toward Hep B. Around 60% of subjects believed that they could become infected with Hep B. Less than half of respondents (48.9%) never went for Hep B screening but >80% of participants (81.9%) were immunized against Hep B.[14]

Table 3: Practices of study participants on various aspects of hepatitis B (*n*=363)

Variable	Medical students (*n*=180), *n* (%)	Nursing students (*n*=183), *n* (%)	Total (*n*=363), *n* (%)	χ^2; *P*
Hepatitis B vaccination status				
Yes	149 (82.8)	128 (70.0)	277 (76.3)	0.001
No	29 (16.2)	41 (22.4)	70 (19.3)	
Don't know	1 (0.5)	0 (0.0)	1 (0.3)	
Not answered	1 (0.5)	14 (7.6)	15 (4.1)	
Wearing gloves before handling patients				
Yes	150 (83.3)	146 (79.8)	296 (81.5)	<0.001
No	13 (7.2)	3 (1.6)	16 (4.4)	
Don't know	13 (7.2)	4 (2.2)	17 (4.7)	
Not answered	4 (2.2)	30 (16.4)	34 (9.4)	
Proportion of students who came in direct contact with blood/body fluids				
Yes	53 (29.4)	61 (33.3)	114 (31.4)	<0.001
No	122 (67.8)	98 (53.6)	220 (60.6)	
Not answered	5 (2.8)	24 (13.1)	29 (8.0)	
Follow of universal precautions while handling needles				
Yes	150 (83.3)	147 (80.3)	297 (81.8)	<0.001
No	4 (2.2)	2 (1.1)	6 (1.6)	
Don't know	20 (11.2)	6 (3.3)	26 (7.2)	
Not answered	6 (3.3)	28 (15.3)	34 (9.4)	
Disposing needles as per biomedical waste management				
Yes	144 (80.0)	150 (82.0)	294 (81.0)	<0.001
No	4 (2.2)	3 (1.6)	7 (2.0)	
Don't know	26 (14.5)	5 (2.7)	31 (8.5)	
Not answered	6 (3.3)	25 (13.7)	31 (8.5)	
Suffered/witnessed a needle stick injury				
Yes	36 (20.0)	48 (26.2)	84 (23.1)	0.159
No	144 (80.0)	135 (73.8)	279 (76.9)	

#*P* value calculated either by chi-square or fisher exact test

In another cross-sectional study carried out by Gonçalves and Gonçalves, more than 90% of nurses and physicians of a maternity hospital and family health teams in Manaus (Brazil) were aware that Hep B is a disease of compulsory notification.[15]

Setia *et al.* (2013) carried out a similar study among HCWs at a tertiary healthcare in Punjab and found that 76% of dental, 81% medical, and 63.6% nursing interns believed HCWs are at increased risk of acquiring Hep B, the difference being statistically significant ($P = 0.05$). About 88% of dental, 89% medical, and 78.2% nursing interns were Hep B vaccinated. Among vaccinated, 70% dental interns (69.3%), medical interns (73%), and nursing interns (72%) had received complete three-dose vaccine schedule. Whereas less than half of dental interns (24%), medical interns (17%), and nursing interns (14%) received only single vaccine dose.[16]

In a prospective interventional study carried out by Yasobant *et al.*, among doctors working in primary and community health centers of Gujarat, it was showed that only 46.4% were vaccinated completely against Hep B. About 26.8% received preliminary dose. However, they failed to complete course either due to lack of time (12.5%) or interest (7.2%). Around 4.5% of respondents had suffered from NSI in the past 6 months. Around 30.4% reported ever coming across Hep B patients.[17]

Batra *et al.* carried out a prospective study among 464 seronegative HCWs in Jodhpur and reported that 49.6% of subjects were vaccinated, 46.1% unvaccinated, and 4.3% partially vaccinated, missing mostly third dose. Among HCWs, doctors had highest vaccination rate (92.5%), followed by medical students (62.4%), nursing staff (41.6%), technical staff (24.2%), administrative staff (12.1%), nursing students (8.5%), and grade IV/laundry staff (0%). About 85.7% used gloves regularly and 98.2% always used new syringe. Around 82.1% and 86.6% agreed washing their hands pre- and post-patient examination or sample handling, respectively. Only 16.1% received training in universal precautions, 21.4% in safe injection practices, and 42% in BMW management. The authors further added that out of 166 randomly selected vaccinated (partially or fully) HCWs (seronegative to HBsAg), 30% had anti-HB titer <10 mIU/mL, 10.8% between 10 and 100 mIU/mL, and 59.2% >100 mIU/mL. The mean values of anti-HB titer for those vaccinated >5 years ago (334.8 mIU/mL) were significantly lower than those vaccinated <5 years ago (649.2 mIU/mL) ($P < 0.05$). Among those completely vaccinated HCWs, only 34 (14.7%) had received a booster dose irrespective of time since vaccination. Of them, 10 (29.5%) subjects received booster dose <1 year ago, while the remaining 24 (70.5%) participants received it more than a year ago. The mean anti-HB was 1742.7 and 629.2 mIU/mL, respectively, which was statistically significant ($P < 0.002$).[18]

In a prospective study carried out in a tertiary hospital at New Delhi, the authors reported that doctors (73.7%) had higher exposure rates of NSI, sharps, and splashes compared with nurses (19.1%). A significant number of HCWs (125, 26.3%)

vaccinated in the past had anti-HB titers <10 mIU/mL. Only 44 sources were found to be seropositive: 24 for HBV, 9 for Hep C virus, and 11 for human immunodeficiency virus. Only 58.4% HCWs were using personal protective equipment during exposure. Cleaning injured site under running water was the most frequently used first-aid measure by 62.4% of HCWs. However, 1.7% HCWs did not take any immediate action.[19]

Conclusion

This study shows that despite low awareness level about disease, most medical and nursing students had sufficiently high knowledge regarding available vaccine and have underwent vaccination. However, only half of them could complete their three-dose vaccination schedule. Only a handful of vaccinated subjects underwent further post-vaccination titer assessment. This highlights the need to improve their baseline knowledge about disease and reinforce correct practice behaviors.

Recommendations

This study draws attention toward generation of institutional level policy that mandates 100% adult Hep B vaccination at no cost to all undergoing medical/nursing training. Recommendations for post-vaccination anti-HB titer assessment should also be included to identify need for booster dose.

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Conflicts of interest

There are no conflicts of interest.

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