Awareness of hepatitis B infection among healthcare students in a private medical college in Odisha

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Abstract

Background: The emergence of the blood-borne pathogens and the increasing number of infected patients and the increasing interest in dental health care compel the dental professionals to have thorough knowledge about communicable diseases and the MBBS and nursing students are always at risk because of their profession. As hepatitis B infection is a major health hazard throughout the world, healthcare students should have thorough knowledge about this disease. Setia et al. had conducted a similar kind of study in Punjab in which the sample size was smaller and it included only the interns, whereas the present study was conducted to assess the level of knowledge, attitude, and behavior about hepatitis B infection among healthcare students of all academic years because they are indulged in clinical work since third year of their curriculum.

Materials and Methods: A cross-sectional survey was conducted of all the students starting from 1st year to final year and the interns of MBBS, BDS, and nursing at KIIT University. The questions were obtained from a study performed in Turkey in 2010 and were modified by an infection control expert. Questions in multiple choice format were in English and it was a self-administered questionnaire consisting of three parts (knowledge, attitude, behavior). Then, ethical clearance for the study was obtained from the institutional ethical committee, KIMS. Subsequently, the students were well informed and explained about the study. Students who voluntarily wanted to participate were included in the study. Questionnaire containing 20 questions to assess the level of knowledge, attitude, and behavior about hepatitis B was distributed among the students. Data were compiled and statistical analysis was done.

Results: The response rate was 83% (N = 332). In our study, majority (96.99%) were aware of transmission of HBV infection by blood, body fluid, and secretion. The level of knowledge was higher in MBBS students than BDS and nursing students (MBBS > BDS > nursing). Attitude toward the disease was higher in MBBS students than BDS and nursing students (MBBS > BDS > nursing), whereas behavior was higher in BDS students than MBBS and nursing students (BDS > MBBS > nursing).

Conclusion: In our study, overall knowledge and attitude toward hepatitis B infection were higher in MBBS students than in dental and nursing students, whereas behavior of dental students toward the disease was quite satisfactory than MBBS and nursing students.

Key words: Awareness, BDS, healthcare students, hepatitis B infection, MBBS, nursing

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INTRODUCTION

Hepatitis B infection is a major health hazard throughout the world and the 10th leading cause of death. Three hundred and fifty million chronic carriers of hepatitis B virus (HBV) are present throughout the world.[1] In India, HBsAg carriers are about 40 million, i.e. about 4–5% of the entire population, and the transience rate is approximately 1%.[1]

HBV is a DNA virus belonging to hepadnaviridae family. Humans are the usual hosts and the viral load in the blood is about 108 virions/ml. Medical, dental, and nursing students are more vulnerable to infectious diseases because they directly come in contact with patients and deal with blood transfusion, surgical instrument, and injections.[2] Blood and body fluid are most commonly seen as the mode of transmission in healthcare professionals. So, in all countries, vaccination programs should be made mandatory and training in universal precautions should be given to all medical and paramedical students.

The current study was conducted to assess the level of knowledge, attitude, and behavior about hepatitis B infection among healthcare students in a private medical college in Odisha.

MATERIALS AND METHODS

In Bhubaneswar, Kalinga Institute of Medical Sciences, Kalinga Institute of Dental Sciences, and Kalinga Institute of Nursing Sciences were selected by a simple random technique. Four hundred questionnaires were distributed among MBBS, BDS, and nursing students. A cross-sectional survey was conducted of all the students starting from 1st year to final year and the interns of MBBS, BDS, and nursing at KIIT University. The questions in multiple choice format were in English and based on the most reliable books on infectious diseases. Initially, the students were well informed and explained about the study. Students who voluntarily wanted to participate were included in the study. A questionnaire containing 20 questions to assess the level of knowledge, attitude, and behavior about hepatitis B was distributed among the students. The questionnaire started with person’s name, gender, and educational year; remaining questions were about knowledge, mode of transmission prevention, immunization, and following universal precautions. The statistical analysis was performed by using SPSS software version 20.

RESULTS

The response rate was 83% (N = 332), out of which 3.92% were male and 96.08% were female. Among them, 33.13% were MBBS students, 43.98% were BDS students, and 22.89% were nursing students. The study revealed that the difference in knowledge, attitude, and behavior between male and female was not statically significant (P > 0.05) [Table 1].

The level of knowledge was higher in MBBS than BDS students and was least in nursing students (MBBS > BDS > nursing). Attitude toward the disease was higher in MBBS than BDS students and was least in nursing students (MBBS > BDS > nursing), whereas behavior was higher in BDS than MBBS students and was least in nursing students (BDS > MBBS > nursing) [Table 2].

Comparison of profiles of students with respect to their knowledge, attitude, and behavior revealed that difference in the level of behavior between MBBS and BDS students was statistically significant (P = 0.003), whereas differences in knowledge (P = 0.1935) and attitude (P = 0.2210) were not statistically significant. The difference in attitude

| Table 1: Distribution of students by profile and sex |
| --- |
| Factors | No of students | % of students |
| Profile | | |
| MBBS | 110 | 33.13 |
| BDS | 146 | 43.98 |
| Nursing | 76 | 22.89 |
| Sex | | |
| Male | 13 | 3.92 |
| Female | 319 | 96.08 |
| Total | 332 | 100.00 |

| Table 2: Comparison of profiles of students with respect to their knowledge, attitude and behaviors scores by one way ANOVA |
| --- |
| Profile | Knowledge | Attitude | Behaviour |
| | Mean | SD | Mean | SD | Mean | SD |
| MBBS | 3.75 | 1.07 | 26.27 | 1.95 | 34.97 | 4.95 |
| BDS | 3.51 | 1.12 | 25.77 | 2.51 | 36.66 | 3.21 |
| Nursing | 3.43 | 1.07 | 25.99 | 2.68 | 34.75 | 4.29 |
| Total | 3.57 | 1.10 | 25.53 | 2.53 | 35.66 | 4.19 |
| F Value | 2.2531 | 22.0898 | 7.197 |
| P Value | 0.1067 | 0.00001* | 0.0005* |
| MBBS vs BDS | P=0.1935 | P=0.2210 | P=0.00035* |
| MBBS vs Nursing | P=0.1354 | P=0.00001* | P=0.9297 |
| BDS vs Nursing | P=0.8852 | P=0.00001* | P=0.0029* |

*P<0.05
between MBBS and nursing students was statistically highly significant \((P = 0.00001)\), whereas the levels of knowledge \((P = 0.1359)\) and practice \((P = 0.9297)\) were not statistically significant \((P > 0.05)\). On comparison of BDS and nursing students, the attitude \((P = 0.00001)\) and practice \((P = 0.0029)\) were statistically significant, whereas the level of knowledge was same as that of the BDS students [Table 2].

The percentage of correct answers given by the respondents with respect to knowledge revealed that the differences in the level of knowledge and attitude were statistically significant \((P = 0.00001)\) and the difference between attitude and behavior was statistically significant \((P = 0.00001)\), but the difference between knowledge and behavior was not statistically significant \((P > 0.05)\) [Table 3].

Our study showed that the level of knowledge regarding the means of contamination was the highest in MBBS students \((99.09\%)\) and the lowest in BDS students \((95.21\%)\), which was not statistically significant.

Knowledge about infection control methods was highest in nursing students \((72.37\%)\), whereas knowledge about dentists’ role in spread of hepatitis B was highest in BDS students \((74.34\%)\) [Table 4].

On comparison of profiles of MBBS, BDS, and nursing students with respect to their attitude, it was observed that the attitude of MBBS students toward the training regarding hepatitis infection \((P = 0.00001)\), medical waste management \((P = 0.00001)\), sterilization of instruments \((P = 0.0040)\), vaccination of medical staff who are working with blood and body fluids \((P = 0.00001)\), and recording the systemic conditions like hepatitis in patients’ files \((P = 0.000001)\) was higher than BDS students and was least in the nursing students. The attitude of BDS students toward immediate immunoglobulin installation and vaccination after instrument injury to non-vaccinated health workers and autoclaving of instruments was higher than MBBS and it was least in nursing students [Table 5].

Comparison of profiles of students in each item of behavior revealed that practice of wearing gloves for patients having non-intact mucosa or skin was in the order BDS > nursing > MBBS \((P = 0.3600)\). Practice of washing hands before and after treatment procedure was in the order BDS > MBBS > nursing \((P = 0.080)\). Practice of wearing goggles during treatment procedure was in the order BDS > MBBS > MBBS \((P = 0.130)\). Practice of wearing protecting gowns was highest in

### Table 3: Correlations among knowledge, attitude and behaviour by Karl Pearson’s correlation coefficient method

| Variables                      | \(r\) value | \(t\) value | \(P\) value |
|--------------------------------|-------------|-------------|-------------|
| Knowledge and attitude scores  | 0.2550      | 4.7916      | 0.00001*    |
| Knowledge and behaviour scores | 0.0025      | 0.0450      | 0.9642      |
| Attitude and behaviour scores  | 0.3107      | 5.9371      | 0.00001*    |

\(*P<0.05\)

### Table 4: Comparison of profiles of students with each item of knowledge by Kruskal Wallis ANOVA

| Profile                           | MBBS % | BDS % | Nursing % | Total | \(H\) value | \(P\) value |
|-----------------------------------|--------|-------|-----------|-------|-------------|-------------|
| Q1. Means of contamination        | 109    | 99.09 | 139       | 95.21 | 322         | 4.4170      | 0.1100      |
| Q2. Infection control method for HBV& HIV are same | 63   | 57.27 | 105       | 71.92 | 55          | 72.37       | 233         | 5.9820  | 0.0500* |
| Q3. Dentists role in spread of HBV | 83    | 75.45 | 110       | 75.34 | 45          | 59.21       | 238         | 7.5360  | 0.0290* |
| Q4. Contamination by saliva       | 53     | 48.18 | 54        | 36.99 | 43          | 56.58       | 150         | 8.3200  | 0.0160* |
| Q5. Knowledge about HBV vaccination prog | 98    | 89.09 | 104       | 71.23 | 42          | 55.26       | 244         | 27.0050 | 0.00001* |

\(*P<0.05\)

### Table 5: Comparison of profiles of students in each item of attitude (Numbers are mean)

| Questions                                | MBBS     | BDS     | Nursing  | Total    | \(H\) value | \(P\) value |
|------------------------------------------|----------|---------|----------|----------|-------------|-------------|
| Q6. Training on Hep & infectious disease | 3.93     | 3.81    | 3.66     | 3.81     | 23.5900     | 0.00001*    |
| Q7. Post exposure prophylaxis            | 3.22     | 3.47    | 2.97     | 3.27     | 12.3260     | 0.0020*     |
| Q8. Medical Waste management             | 3.82     | 3.78    | 3.36     | 3.70     | 22.7960     | 0.00001*    |
| Q9. Sterilization & disinfection of instruments. | 3.88  | 3.82    | 3.61     | 3.79     | 10.9750     | 0.0040*     |
| Q10. Washing of instruments after treatment & before autoclaving | 3.75     | 3.78    | 3.62     | 3.73     | 7.5940      | 0.0220*     |
| Q11. Medical staff vaccination           | 3.83     | 3.57    | 3.29     | 3.59     | 17.1260     | 0.00001*    |
| Q12. Recording HBV patients information regarding systemic condition | 3.85     | 3.55    | 3.49     | 3.64     | 25.2250     | 0.00001*    |

\(*P<0.05\)
BDS students ($P = 0.0380$). Practice of wearing mouth mask ($P = 0.740$), bending needle after procedure ($P = 0.00001$), checking blood for contagious diseases ($P = 0.0100$), informing about hepatitis B and offering vaccination ($P = 0.9278$) was highest in BDS students [Table 6].

The study results showed that the maximum number of students learned about measures of hepatitis B infection control through books (38%) and the second most preferred answer was lectures (18.98%).

**DISCUSSION**

The emergence of blood-borne pathogens along with increasing number of infected patients and the increasing interest in dental health care compel the dental professionals to have thorough knowledge about communicable diseases. MBBS and nursing students are always at risk because of their profession. So, we sought to determine the level of knowledge, attitude, and behavior of the medical, dental, and nursing students about hepatitis B infection. Also, we wanted to encourage the medical, dental, nursing students to increase the level of knowledge and obey the infection control measures.

In our study, majority of the students (96.99%) were aware of transmission of HBV infection by blood, body fluid, and secretion. When analyzed, MBBS students had better knowledge (99.9%) than BDS (95.21%) and nursing students (97.37%). But according to Tirounilacandin et al., dental interns (34.7%) had marginally better knowledge than medical interns (32.8%). Also, 64% of the students had good knowledge about the mode of transmission of HBV. A study done by Setia et al. showed that all dental and nursing students believed that blood and blood products are the mode of transmission, but awareness in relation to other modes of transmission was dissatisfactory. The probable reason for the difference in results obtained could be the sample size.

In our study, more nursing and BDS students compared to MBBS students believed that the infection control methods for HBV and Human Immunodeficiency Virus are same. A similar study by McCarthy and Britton showed that compared with dental students, higher proportion of medical and nursing students reported using extra infection control measures for treating Human Immunodeficiency Virus patients, indicating that dental students have a better comprehension of the concept of universal precaution, that is, all patients should be treated as infective with appropriate infection control precaution because infected persons cannot be always indentified.\(^4\)

Dentist plays a very important role in spread of HBV. Most of the MBBS and dental students believed this, but the nursing students (59.21%) had less awareness regarding this fact. According to Mahesh et al., awareness among the dental students about the spread of HBV from dentist to patient was found to be low.\(^5\) Another study, it was reported that 76% dental interns, 81% medical and 63.6% nursing interns believed that healthcare workers are at risk of developing hepatitis B infection because of their profession which predisposes them to acquire and transmit infection.\(^6\) As a result of HBV transmission to the patient from health worker, now Health Canada recommends mandatory HBV immunization and post-exposure immunization for all healthcare workers and students who are performing different treatment procedures.\(^4\)

The spread of HBV through contamination of saliva is believed by 48.18% MBBS, 36.99% BDS, and 56.58% nursing students. According to Ramakrishna et al., 72.2% dental students believed that HBV spreads through saliva,\(^5\) which shows the lack of awareness of dental, medical, and nursing students regarding contamination of HBV through saliva.

Knowledge about hepatitis B vaccination program was about 73% and was the highest in MBBS than BDS students (95.21%). Practice of hepatitis B vaccination program was compared to MBBS students believed that hepatitis B vaccination program was mandatory for all health workers, but the dental students (95.21%) had less awareness regarding this fact. According to Mahesh et al., awareness among the dental students about the hepatitis B vaccination program was found to be low.\(^5\) Another study, it was reported that 76% dental interns, 81% medical and 63.6% nursing interns believed that healthcare workers are at risk of developing hepatitis B infection because of their profession which predisposes them to acquire and transmit infection.\(^6\) As a result of HBV transmission to the patient from health worker, now Health Canada recommends mandatory HBV immunization and post-exposure immunization for all healthcare workers and students who are performing different treatment procedures.\(^4\)

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| Questions                                      | MBBS | BDS  | Nursing | Total | $H$ value | $P$ value |
|------------------------------------------------|------|------|---------|-------|-----------|-----------|
| Q13. Wearing gloves                            | 4.63 | 4.77 | 4.70    | 4.70  | 2.0410    | 0.3600    |
| Q14. Using handwash before & after procedure   | 4.88 | 4.94 | 4.75    | 4.88  | 9.5960    | 0.0080*   |
| Q15. Wearing Goggles during treatment          | 3.04 | 3.64 | 3.46    | 3.40  | 8.6730    | 0.0130*   |
| Q16. Wearing Gown/lab coat during treatment    | 4.42 | 4.68 | 4.33    | 4.52  | 6.5190    | 0.0380*   |
| Q17. Wearing Mask during treatment             | 4.40 | 4.69 | 4.63    | 4.58  | 5.2160    | 0.0740    |
| Q18. Disposal of the Needles                   | 4.75 | 4.86 | 4.22    | 4.68  | 19.1240   | 0.00001*  |
| Q19. Blood tests for contagious diseases before treatment | 4.45 | 4.60 | 4.18    | 4.46  | 9.2270    | 0.0100*   |
| Q20. Informing patient about HBV & offer vaccination | 4.40 | 4.47 | 4.47    | 4.45  | 0.1510    | 0.9270    |

*P<0.05
and nursing students, in contrast with a study done in Haryana by Bansal et al. in which it was only 54.7%. Care should be taken to improve the knowledge of BDS and nursing students regarding this because dental students are more prone for transmission of hepatitis B as they use more frequently sharp instruments than the other two study groups.

A positive attitude toward training regarding hepatitis B and infectious disease was seen among the students; 83% of the students believed it is very important to be trained regarding this disease, which is very much encouraging. But only 51.8% students believed that post-exposure prophylaxis was very important, out of which dental students were more aware than MBBS and nursing students, which is similar to another study conducted by McCarthy and Britton.[4] Another study conducted among 1st and 2nd year dental students in Mangalore by Vasanthakumar showed around 69.8% awareness regarding post-exposure prophylaxis for hepatitis B.[6]

In our study, 84.6% of students believed that it is very important that the instruments used for patients should be disinfected and sterilized, but this was believed more by MBBS students than BDS and nursing students, whereas a study conducted in Faculty of Dentistry, Ankara University by Akbulut et al. showed most of the dental students believed that sterilization of instrument is very much important. As BDS and nursing students come into contact with sharp instruments more often than MBBS students, it is very much necessary to create awareness among them regarding sterilization.[7]

The behavior of our students toward the disease was satisfactory, but following universal precautions like using gloves, glasses, lab coat, mask, washing hands before and after the procedure was found to be highest in BDS students than MBBS and nursing students. Similarly, another study by McCarthy and Britton showed less frequent use of barriers by medical and nursing students than BDS students.[4]

CONCLUSION

In our study, overall knowledge and attitude toward HBV infection were higher among MBBS students than dental and nursing students, whereas behavior of dental students toward the disease was quite satisfactory than MBBS and nursing students. So, as the dental and nursing students are more prone for the spread of infection, awareness should be created among them as well in the city of Bhubaneswar to reduce the spread of hepatitis B infection.

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Conflicts of interest

There are no conflicts of interest.

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