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Knowledge, attitude and practices regarding hepatitis B and infection control among clinical dental students

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Abstract

Background: Cross infection has become a paramount concern for the health care professionals who deals with mucosa, blood or blood contaminated with bodily fluids. HBV infection is the most important infectious occupational hazard in the dental profession and dental surgeons are at a great risk of exposure to hepatitis due to numerous encounters involving the use and disposal of sharps instruments.

Aims and objectives: To assess the knowledge, Attitude and Practices regarding Hepatitis B and Infection control among clinical dental students.

Methods: A cross-sectional, self-administered questionnaire survey consisting of 24 questions. The study population comprises of Intern, Final year and Third year clinical under graduate students from various dental institutions covering the states of Karnataka, Kerala, Tamil Nadu and Andhra Pradesh in India. The data extracted were tabulated, statistically analyzed and results are obtained. Results were calculated on the basis of frequency and percentages using SPSS.

Results: Result of the present study shows that the level of knowledge and attitude regarding hepatitis B and infection control among the clinical dental students are fairly satisfactory, although, the practices towards hepatitis B and infection control are reasonably good. The level of knowledge was good among interns and final-year students compared with third year students.

Conclusion: There is a need to provide formal and obligatory education about Hepatitis B infection, its transmission, prevention along with update on infection control practices for the health care providers. It is important that the dental students be aware of the risks and the seriousness of infection.

Keywords: Infection control, knowledge, dental students, hepatitis B

Introduction

Hepatitis is considered as a silent epidemic of the modern world. It is a highly infectious disease which is 50-100 times more contagious than HIV. Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus (HBV). HBV is a DNA virus belonging to the hepadnae virus family and human beings are the sole reservoir. It can cause chronic infection and puts people at high risk of death from cirrhosis and liver cancer^[1]. Acute infection manifests as acute viral hepatitis – an illness that begins with general malaise, loss of appetite, nausea/vomiting, body aches, low-grade fever, darkened urine and then progresses to development of jaundice. The incubation period is 30–180 days. Chronic infection with HBV may be either asymptomatic or may be associated with a chronic inflammation of the liver (chronic hepatitis), leading to cirrhosis over a period of several years^[1].

The average estimated carrier rate of hepatitis B virus (HBV) in India is 4%, with a total pool of approximately 40 million carriers. Approximately 780,000 persons die each year from hepatitis B infection, 650,000 from cirrhosis and liver cancer due to chronic hepatitis B infection and another 130,000 from acute hepatitis B. Every health care specialty that involves contact with mucosa, blood or blood contaminated with bodily fluids should have the goal of ensuring compliance with standard precautions and other methods to minimize infection risks^[2]. It has been documented that HBV infection is the most important infectious occupational hazard in the dental profession. Dental surgeons are at a great risk of exposure to hepatitis due of their numerous encounters involving the use and disposal of sharps instruments^[1].

The incidence of HBV infection can be reduced by giving proper education and awareness regarding its transmission and vaccination to the health-care workers.

Hence, this study was conducted to assess the knowledge, attitude and practices regarding hepatitis b and infection control among clinical dental students”.

Methods

A cross-sectional, self-administered questionnaire survey was conducted among the Intern, Final year and Third year under graduate students from various dental institutions covering the South Indian states of Karnataka, Kerala, Tamil Nadu and Andhra Pradesh during the academic year in January – March 2018. All students in the study, voluntarily completed a questionnaire consisting of 24 close-ended questions. Based on convenience sampling method one college was selected randomly from Indian states of Karnataka, Kerala, Andhra Pradesh and Tamil Nadu. Subjects who are pursuing Internship, Final year and Third year under graduation in selected dental institutions of above mentioned states were included in the study whereas subjects who were not willing to participate in the study were excluded. Ethical clearance was obtained from the Institutional Review Board of Coorg Institute of Dental Sciences, Virajpet and permission was obtained from the Principals of the respective colleges prior to data collection. Written Informed consent was taken from all the study participants. After obtaining the necessary permission, the objectives of the study were explained to the participants and data were collected directly by approaching the colleges. The Questionnaire consisted of four parts: First part included Demographic information like gender and year of study. For maintaining confidentiality of information, name of the person and college were not collected. Second, Third and Fourth part composed of questions about the knowledge (Questions 1–6), attitude (Questions 7–13) and practices (Questions 14–24) of dental students regarding hepatitis B and infection control. The answers to knowledge, attitude and practices based questions are Yes/No, except for the question regarding the vaccination dosage where the answers were <3 doses/3doses/3 doses followed by a booster dose/don't remember and for the question regarding the cause of percutaneous injury, the answers were Needle/Bur/File/Reamer/Wire/Elevator. All the students were given a time period of 30 minutes for completing the questionnaire and they were advised not to discuss with friends and referring to books and mobiles. Data collected and descriptive statistics were prepared using Microsoft excel 2007 version. The data obtained was coded and fed into the SPSS (Statistical Package for Social Sciences) version 17 for analysis and categorical data were presented as number and percentages by using contingency tables and continuous data as mean and standard deviation. Data was analyzed using Chi-square test and all statistical tests were performed at 95% confidence interval. A p value less than 0.05 was considered as statistically significant.

Results

A cross-sectional, self-administered questionnaire survey was conducted among 734 Clinical undergraduate dental students. The study subjects were distributed across the south Indian states of Karnataka (104), Kerala (142), Andhra Pradesh (235) and Tamil Nadu (253) as shown in Table 1. The study participants comprised of 261 males and 473 females as shown in Table 2. The total number of third years who participated in the study were 249, followed by 250 final years and 235 house surgeons. All the study participants were aware of hepatitis B disease and it is transmitted by virus. 86.5 % of the study participants have answered that hepatitis B is transmitted through contaminated infected blood

transfusions. 80.8% of the participants have been vaccinated against hepatitis B and 32.3% of them have completed 3 doses of vaccine followed by a booster dose. 98.9% of the study participants stated that HBV vaccination is mandatory for all dental practitioners. 83.4% stated that proper isolation during treatment is important for infection control in dentistry and 93.3% of the participants stated that they will take a thorough history of patient to rule out HIV/HBV status. 98.6% of the participants uses gloves, facemask, head cap and gown. only 32.3% of the participants uses eye protection wear during treatment procedures. 41.6% of the participants had non-sterile occupational percutaneous injury and 23.3% of them had Needle prick injury, whereas 8.9% had bur injury, and 7.6%) had orthodontic wire injury. 79.2% of the participants washes their hands regularly before and after examining patients. only 32.2% of the participants were aware of PEP(Post Exposure Prophylaxis) whereas 67.8% were unaware of PEP. 72.4% of the study participants follows proper Bio medical waste management (colour coded bins). 98.4% of the participants knows the precautionary measures to be taken against hepatitis B in their routine practices.

Discussion

Dentists are at high risk of infection by blood-borne pathogens, as they are continually exposed to blood and saliva mixed with blood, and may even suffer needle punctures. The key to reducing or preventing the transmission of a variety of micro-organisms to dentist lies in strict adherence to infection control practices ^[5]. The present study was conducted to evaluate the knowledge, Attitude and Practices regarding Hepatitis B and Infection control among clinical dental students and also assessed their education and provided self-assessment to their basic knowledge and implementation of infection control policy.

According to the review by *Gautam Ray* ^[3], Hepatitis B is a common disease all over the world, and countries have been divided into three groups (high, intermediate and low) according to its endemicity and India falls in the intermediate endemicity zone (prevalence of 2–7%, with an average of 4%), with a disease burden of about 50 million. 80.8% of the study participants have been vaccinated against HBV and 32.3% of them have completed their vaccination schedule including the booster dose which is similar to that reported in other study by Hashem-Motahir Al-Shamiri *et al.* ^[8] in Saudi Arabia among clinical dental students (4th & 5th years). Cross infection prevention in dental clinic and schools during a dental procedure is of immense significance, as well as all para-dental auxiliaries must adhere to the standard guidelines of prevention and safety measures particularly at the time of patients handling. The efficacy of HBV vaccination can be assessed by post-immunization HB titre level. Unfortunately, only 13.8% of students who were immunized reported post-HBV immunization serology, whereas 86.2% have not been tested and this result is in contrast with study conducted by Santhosh Kumar MP *et al.* ^[10], in Chennai wherein 52% have been tested for post HBV vaccination. Periodic monitoring and serological testing among health care workers (HCWs) should be encouraged to reduce the risk of acquiring hepatitis B following an occupational exposure.

Around 60.2% of the participants have stated that dentists are at risk of acquiring HBV and this is in contrast with study conducted by Abhinav Singh *et al.* ^[12] in Central India. 96.7% stated that disinfection of dental clinic is important to prevent cross infection among patients and dental personnel which is in accordance with study conducted by Xinyi Li *et al.* ^[13] in

China wherein 93% have agreed the same.

Universal precautions introduced by the Centers for Disease Control (CDC) in 1985, mostly in response to the human immunodeficiency virus (HIV). Universal precautions are a standard set of guidelines aimed at preventing the transmission of blood borne pathogens from exposure to blood and other potentially infectious materials (OPIM). Universal precautions refers to the practice, in medicine, of avoiding contact with patients' bodily fluids, by means of the wearing of nonporous articles such as medical gloves, goggles, and face shields [2]. In the present study, 68.9% of the participants were aware of universal or standard precautions and use of personal protective equipments which is in accordance with study conducted by Santhosh Kumar MP *et al.* [10] in Chennai wherein 59.3% were aware of the universal precautions.

Around 83.4% of the participants have stated that proper isolation during treatment will control infection in dentistry which is in accordance with study conducted by Abhinav Singh *et al.* [12] in Bhopal wherein 92.2% stated that isolation is important in infection control. 93.3% of the participants stated that they will take a thorough history of patient to rule out HIV/HBV status which is in accordance with study conducted by Asia Batool *et al.* [14] in Lahore wherein 97% of the participants have agreed the same.

CDC guidelines pay firm emphasis on wearing face masks and gloves on each and every patient, changing face mask and gloves after completing the individual patient, wearing protective clothes and protective eyewear which should be properly disinfected or sterilized before reuse. After each and every patient hands must be thoroughly washed with an antimicrobial solution followed by drying of the hands [4]. 98.6% of the participants use gloves, facemask, head cap and gown and compliance with protective eyewear was very low; only 32.3% reported using protective eyewear at all times. Similar results are reflected in many studies conducted in the UK, UAE, Germany and Nigeria, which have also shown that a majority of dental students did not use eye protection most of the time as a safety measure. 41.6% of the participants had non-sterile occupational percutaneous injury and 23.3% of them had Needle prick injury which is commonly encountered among the participants which is in accordance with study conducted by Santhosh Kumar MP *et al.* [10] in Chennai wherein 48% of the participants experienced needle prick injury. Another important issue to be considered is the awareness about PEP. Hepatitis B immunization and post exposure management are integral components of a complete program to prevent infection following blood borne pathogen exposure.

Only 32.2% of the participants were aware of PEP which is in accordance with study conducted by Romi Jain *et al.* [11] in Mumbai wherein 32.4% of the participants were aware of PEP and this is in contrast with study conducted by Santhosh Kumar MP *et al.* [10] in Chennai wherein 92% of the participants were aware of PEP. This reflects that the students doesn't have a good knowledge and awareness about management protocols of HBV infections. 72.4% follows proper Bio medical waste management (colour coded bins) which is in accordance with study conducted by Santhosh Kumar MP *et al.* [10] in Chennai wherein 78% of the study participants follows proper Bio medical waste management.

The level of Knowledge, Attitude and Practices among clinical dental students in the present study is lower when compared to the studies conducted in Taiwanese dental students and dental students in Brazil and Turkey, whereas the

level of Knowledge, Attitude and Practices is higher when compared to the studies conducted in dental students in Saudi Arabia, Yemen, and Karachi [8, 14, 16]. The level of knowledge attitude and practices are in accordance with the studies conducted in Indian states like Mumbai, Nashik, Mysore and Chennai [7, 10, 11, 17] and the level is higher when compared to the studies conducted in Jammu and Kashmir and Bhopal [9, 12]. This difference in the level of knowledge may be due differences in existing policies, awareness & presence of immunization programmes in places where the studies are conducted and also depends on the curriculum.

In the present study, the overall level of knowledge about HBV infection among dental students of various years of graduation was fairly satisfactory. The level of knowledge was good among interns and final-year students compared with third year students. The third-year students showed average response, response being neither poor nor good, which could be due to the awareness created once they enter the professional dental course. Based on the results of the study, we infer that there is a need to improve knowledge about HBV infection among third-year students. Based on study results, it is suggested that some improvement to be needed towards developing a positive attitude and practices among students. This can be improved by refreshing and upgrading their knowledge by providing continuous education of universal infection control measures through arranging sessions or lectures for students of each professional year. Dental students will be more likely to comply with an infection control program and exposure control plan if they understand its rationale. Clearly written policies, procedures and guidelines can help ensure consistency, efficiency and effective coordination of activities.

It is recommended to focus on strategies to motivate dental students to implement infection control measures with their routine use. Moreover, dental schools could offer opportunities for students to analyze their own experiences in the dental clinic from the perspective of infection control.

Conclusion

Results of the present study shows that the level of knowledge and attitude regarding hepatitis B and infection control among the clinical dental students were fairly satisfactory, although, the practices towards hepatitis B and infection control were reasonably good. It also shows that there is a need to provide formal and obligatory education about Hepatitis B infection, its transmission, prevention along with update on infection control practices for the health care providers. It is important that the dental students be aware of the risks and the seriousness of infection.

It is essential that all barrier techniques should become a protocol and a norm in student's daily practice as well as clinicians. In addition to following standard infection control measures, we should encourage students and other clinical/non-clinical staff, as well as patients, to be vaccinated against Hepatitis B and other contagious diseases.

Finally, these results suggest that viral infections such as Hepatitis B and other contagious diseases should be carefully considered by our society as a whole, as well as those instructing the new generation of dental students. If these are disregarded, dental students may face a serious challenge against their own health when they step into their clinics. Hence, it is mandatory to treat all patients as potentially infected and follow those standard infection control measures in their daily practice.

Table 1: Distribution of Study Subjects Based on States

| States | Frequency | Percentage (%) |
|----------------|-----------|----------------|
| Karnataka | 104 | 14.2% |
| Kerala | 142 | 19.3% |
| Andhra Pradesh | 235 | 32.0% |
| Tamil Nadu | 253 | 34.5% |
| Total | 734 | 100 % |

Table 2: Distribution of Study Subjects Based on Gender

| Gender | Frequency | Percentage (%) |
|--------|-----------|----------------|
| Male | 261 | 35.6% |
| Female | 473 | 64.4% |
| Total | 734 | 100 % |

Table 3: Distribution of Study Subjects Based On Year of Study

| Year of study | Frequency | Percentage (%) |
|----------------|-----------|----------------|
| Third years | 249 | 33.9% |
| Final years | 250 | 34.1% |
| House surgeons | 235 | 32.0% |
| Total | 734 | 100% |

Table 4: Distribution of Responses to Questions

| Knowledge Based Questions | | | |
|----------------------------------|---|-----------------------------------|------------|
| S. No | Questions | Response | Frequency |
| 1 | Have you heard of Hepatitis B disease? | Yes | 734(100%) |
| | | No | 0(0) |
| 2 | Is it transmitted by virus? | Yes | 734(100%) |
| | | No | 0(0) |
| 3 | Is it transmitted through contaminated infected blood transfusions? | Yes | 635(86.5%) |
| | | No | 99(13.5%) |
| 4 | Does hepatitis B manifest as jaundice? | Yes | 470(64%) |
| | | No | 264(36%) |
| 5 | Have you been vaccinated against HBV? | Yes | 593(80.8%) |
| | | No | 141(19.2%) |
| | If yes, how many doses of hepatitis B vaccination you had? | < 3 doses | 56(7.6%) |
| | | 3 doses | 215(29.3%) |
| | | 3doses followed by a booster dose | 237(32.3%) |
| | | Don't remember | 226(30.8%) |
| 6 | Have you been tested for post HBV immunization? | Yes | 101(13.8%) |
| | | No | 632(86.2%) |
| Attitude Based Questions | | | |
| S. No | Questions | Response | Frequency |
| 7 | Do you think HBV vaccination is mandatory for all dental practitioners? | Yes | 726(98.9%) |
| | | No | 8 (1.1%) |
| 8 | Dentists are at risk of acquiring which of the following disease while treating patients? | HIV | 287(39.1%) |
| | | HBV | 442(60.2%) |
| | | HCV | 5(0.7%) |
| | | STD | 0(0) |
| 9 | Do you recommend vaccination against hepatitis B among your family members? | Yes | 597(81.3%) |
| | | No | 137(18.7%) |
| 10 | Do you think disinfection of dental clinic is important to prevent cross infection among patients and dental personnel? | Yes | 710(96.7%) |
| | | No | 24(3.4%) |
| 11 | Are you aware of universal or standard precautions and use of personal protective equipments? | Yes | 506(68.9%) |
| | | No | 228(31.3%) |
| 12 | Do you agree that all patients to be protected as potential infection? | Yes | 599(81.6%) |
| | | No | 135(18.4%) |
| 13 | Do you think proper isolation during treatment is important for infection control in dentistry? | Yes | 612(83.4%) |
| | | No | 122(16.6%) |
| 14 | Do you take a thorough history of patient to rule out HIV/HBV status? | Yes | 689(93.3%) |
| | | No | 49(6.7%) |
| Practice Based Questions | | | |
| S. No | Questions | Response | Frequency |
| 15 | Do you use gloves, facemask, head cap and gown? | Yes | 724(98.6%) |
| | | No | 10(1.4%) |
| 16 | Do you use eye protection wear? | Yes | 237(32.3%) |
| | | No | 497(67.7%) |
| 17 | Do you had any non-sterile occupational pre cutaneous injury? | Yes | 305(41.6%) |
| | | No | 429(58.4%) |
| | If yes, what was the cause? | Needle | 171(23.3%) |
| | | File | 1(0.1%) |

| | | | |
|----|--|-----------|------------|
| | | Bur | 65(8.9%) |
| | | Reamer | 13(1.8%) |
| | | Wire | 56(7.6%) |
| | | Elevator | 0(0) |
| 18 | Do you wash your hands before and after examining patients? | Always | 581(79.2%) |
| | | Sometimes | 153(20.8%) |
| | | Never | 0(0) |
| 19 | Are you aware of PEP? | Yes | 236(32.2%) |
| | | No | 498(67.8%) |
| 20 | Do you bend your needle before disposal? | Yes | 347(47.3%) |
| | | No | 387(52.7%) |
| 21 | Do you follow proper Bio medical waste management (colour coded bins) | Yes | 532(72.4%) |
| | | No | 202(27.6%) |
| 22 | Are you willing to treat patients with infectious diseases? | Yes | 595(81.1%) |
| | | No | 139(18.9%) |
| 23 | Are you willing to follow the same infection control procedures which are taught in your college in your private practice? | Yes | 717(97.7%) |
| | | No | 17(2.3%) |
| 24 | Do you know the precautionary measures to be taken against hepatitis B in your routine practice? | Yes | 722(98.4%) |
| | | No | 12(1.6%) |

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