Original Article

Practice of Universal Infection Control Protocols

Infection Control Protocols

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ABSTRACT

Objective: The objective of this study was to evaluate practice of universal infection control protocols among third and final year BDS students at different dental colleges.

Study Design: Comparative study

Place and Duration of Study: This study was conducted in five dental colleges and hospitals which are affiliated with University of Karachi during the year 2011-2012.

Materials and Methods: The undergraduates (third and final professional BDS students were selected with the age range from 18-22 years and without gender discrimination in the year 2011-2012. A self applied, confidential 14 close-ended type questionnaire consisting of various aspects of infection control practice was distributed to these undergraduates at the end of second semester after the lecture with permission and consent of head of institution. The collected data was analyzed by using SPPS 16.0.

Results: Among 180 students, 90(50%) were final year students and 90(50%) were third year students. Out of them 70 final year and 72 third year students participated. Thus a total of 142 (77.77%) students completed questionnaire with a response rate of 79%. The final year students were found to have more knowledge and had practiced more infection control procedures than third year students.

Conclusion: Compliance with recommended guidelines for cross infection control varies among final year and third year students. Efforts are needed to improve attitudes to implement information and motivate students in the correct and routine use of infection control measures before they commence their clinical rotations.

Key words: risk of infections, sterilization, third year, final year, infection control procedures.

INTRODUCTION

Dentists, dental students, patients, assistants and technicians are exposed to pathogenic microorganism during dental treatment. Microorganisms can be transmitted from dentist to patients and patients to patients through direct or indirect contact with contaminated objects (blood, fluids, instruments, and surfaces) and secretions from conjunctiva, nose and oral cavity[1].

The carriers of microbial diseases are not easy to identify therefore "Centre for disease control" (CDC) recommended universal precautions regarding infection control in dentistry to reduce risk of infections among dentists, assistants, technicians, students and patients[2-7]. The term "Universal Precautions" (modified into "Standard Precaution" in 1996 by CDC) were applied to contact with contaminated blood, body fluids secretions, non broken skin and mucosa, droplets during treatment should be considered as infectious[8]. In different dental schools the overall reported occurrence rates for "needle stick and sharp injuries" (NSIs) have ranged from 1.97/10,000 visits to 12.5/10,000 visits[9]. Younai et al mentioned the higher frequency of injury for third-year students compared to fourth-year students suggesting an elevated risk among the third year students due to inexperience and improper handling during performing invasive procedures[10].The majority of dental residents experienced NSIs those occurred extra-orally during removable prosthetic procedures[9].

Dental surgeons and staff are more prone to Hepatitis and Human Immunodeficiency Virus (HIV) infections[7]. Researchers have proved that the chances of hepatitis B infection after needle stick injuries are more compared to HIV infections[11]. Exposure to infectious agents are accidental in the dental practice and following infection control guiding principle can decrease the chances of cross infection. Sometimes it is very difficult to prevent the exposure, but the correct management after exposure and immunization can be helpful to reduce the chance of cross infection and maintain the defense system[12]. Al-Sohaibani et al. recommended vaccination against HBV to all physicians of Saudi Arab due to their high occupational risk of HBV infection[13]. The compliance of dentists with these specific recommendations and infection control programs has also been studied in many countries[14,15].

There was a lack of local data on this topic therefore study was designed to evaluate the practice of universal infection control protocols among dental students at different dental colleges and universities.

Inclusion Criteria;

- Students of 3rd BDS (juniors) and 4th year BDS (seniors)
- Both genders with age range from 18-22 years.
- Completely filled questionnaire.

Exclusion Criteria;

- First and second year BDS students
- House officers and Post Graduates trainees

MATERIALS AND METHODS

This study was conducted in five dental colleges and hospitals which are affiliated with University of Karachi. It is an observational study in which 180 samples (90 final year and 90 third year students) are drawn through a non-randomized, purposive sampling procedure. A self applied questionnaire containing 14 close-ended questions related to infection control knowledge and practices were distributed among final and third year dental students. The Statistical Package for the Social Sciences (SPSS) version 16.0 was used for the calculations. Results were analyzed and compared by means of frequency and associated statistical tests.

RESULTS

Out of 180 students included 90 were fourth year and 90 were third year students. Only 70 from fourth year and 72 from third year completed the questionnaire. Thus a total of 142(79%) students completed questionnaire.

Out of these 142 students, variation was observed in their count with respect to different infection control regimes being practiced. 72 students (50.7%) (41 final year and 31 third year) informed that they take medical history. 110 students (75%) (62 final year and 48 third year) were immunized against hepatitis B and C. 132 students (96.4%) (68 final year and 64 third year) wore gloves for every dental procedure. 138 (97.9%) (74 final year and 64 third year) informed that they change gloves after each patient. 120 (85.3%) (65 final year and 55 third year) wore face mask. 26 students (18.3%) (15 final year and 11 third year) replaced face mask after every dental procedure (table 1).

A total of 115 students (81.7%) (65 final year and 50 third year) changed extraction instruments after each patient. Only 33 students (23.3%) (20 final year and 13 third year) knew the importance of changing hand piece. 118 students (83.5%) (60 final year and 58 third year) were particular about changing saliva ejectors and only 69 students (48.6%) (49 final year and 20 third year) were educated in regard to the use of sterilized burs between patients (table 1).

However only 39 students (27.46%) (29 final year and 10 third year) used autoclave for sterilization. Plastic wrapping for sterilization of instruments were used by 24 students (16.9%) (16 final year and 8 third year). Rubber dam was used by 22 final year students only (15.8%) while 58 students (44.8%) (38 final year and 20 third year) reported the use of special containers for disposal of sharp objects (table 1).

Table No.1: Comparison of final year and third year students

S. No.	Question	Response Yes			Response No	Total participants
		Final year	Third year	Total	Total	
1.	Medical History	41(56.9%)	31 (43%)	72 (50.7%)	70 (49.3%)	142
2.	Vaccination for hepatitis B and C	62(56.3%)	38(34.5%)	110 (75.2%)	32 (24.8%)	142
3.	Wearing of Gloves	68(51.5%)	64(48.4%)	132 (96%)	10 (5.6%)	142
4.	Changing gloves after each patient	74(53.6%)	64(46.3%)	138 (97.9%)	4 (10%)	142
5.	Wearing Of Face mask	65(54.1%)	55(45.8%)	120 (85.3%)	22(14.7%)	142
6.	Face mask changing between patients	15(57.6%)	11(42.3%)	26 (18.3%)	116 (81.7%)	142
7.	Changing extraction instruments	65(56.5%)	50 43.4%)	115 (81.7%)	27 (18.3%)	142
8.	Changing hand pieces	20(60.6%)	13(39.3%)	33 (23.3%)	109 (76.7%)	142
9.	Changing saliva ejectors	60 50.8%)	58(49.1%)	118(83.5%)	24 (16.5%)	142
10.	Changing burs	49 (71%)	20 28.9%)	69(48.6%)	73 (51.40%)	142
11.	Use of autoclave for sterilization of instruments	29(74.3%)	10 25.6%)	39 (27.46%)	103 (72.5%)	142
12.	Use of plastic wrappings for sterilization of instruments	16(66.6%)	8 (33.3%)	24 (16.9%)	118 (83.1%)	142
13.	Use of rubber dam	22 (100%)	0	22 (15.8%)	120 (84.8%)	142
14.	Disposal of sharp objects	38(65.5%)	20(34.4%)	58 (44.8%)	84 (59.2%)	142

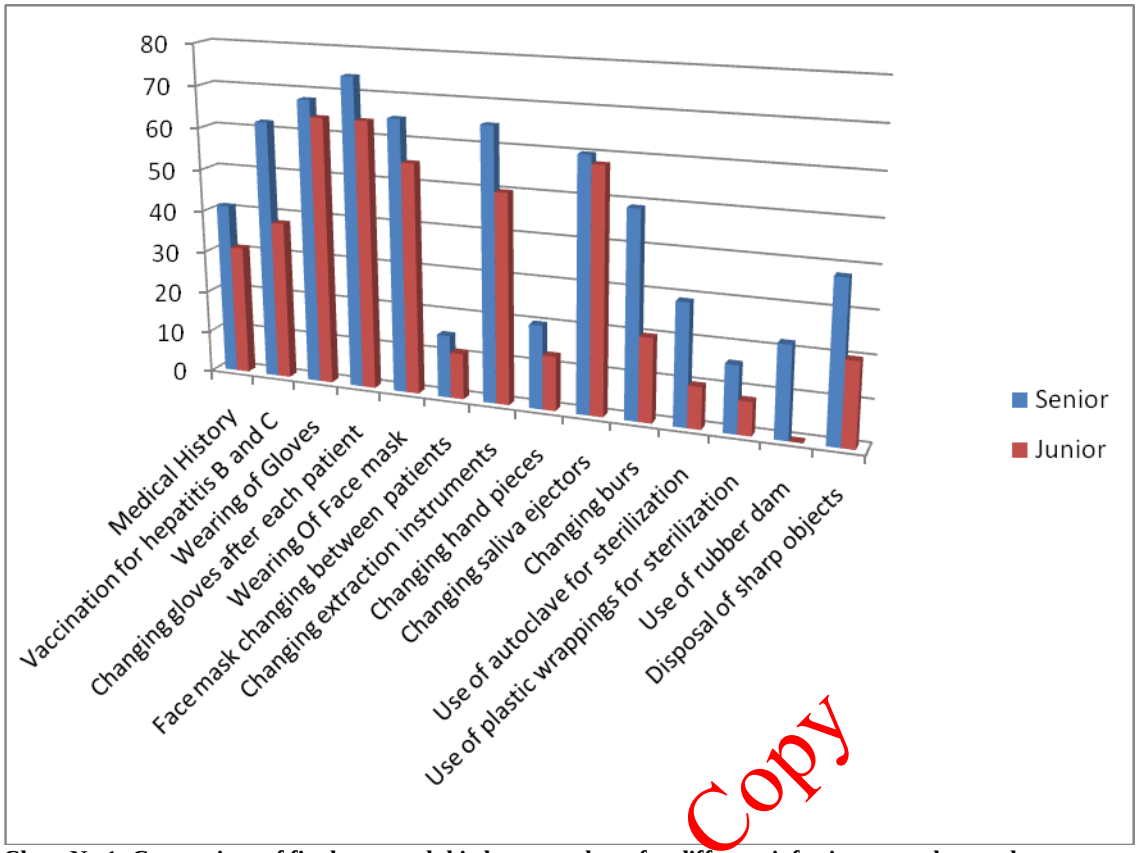

Chart No.1: Comparison of final year and third year students for different infection control procedures

DISCUSSION

Many researchers have revealed that the chances of hepatitis B and C infections were high among dental professionals after needle stick exposure in their studies[16]. Thus, vaccination for hepatitis B coverage was suggested for all dental health care professionals[17]. Rahman et al[18] revealed that 95.8% of final year students were vaccinated against Hepatitis B[18]. However McCarthy and Britton[12] showed 100% immunization in final year students in comparison to our study in which 110 (75.2%) dental students were vaccinated against hepatitis B. The vaccine is cost effective and easily available, thus vaccination of dental health care professionals can be achieved in low cost[19].

Many microorganisms including viral, fungal and protozoa are harmful for dental surgeons and patients. They are more prone to exposure to these microbes either direct contact with blood, skin, and saliva of patient or by indirect contact by sharp instruments or from aerosols[20]. Dental professionals must wear gloves and mask in order to prevent the transmission of source of infection and reduce the risk of infection from operators to the patients and from patients to operators[21]. Rahman et al[18] stated that in his study 99.2% of final year students wore gloves while 98.3% wore face masks as compared to our study in which 133 (96.4%) dental students wore gloves and 120 (85.3%) facemasks. Kumar et al[22] reported that in his study only 21.7% of final year students and 1.4% of third year students changed face masks after each patient which is in high contradiction to our study in which 57.6% of final year and 42.3% of third year students did the same.

The vulnerability of cross infection with the use of dental instruments was emphasized by many authors[23,24]. In order to protect the instruments from environmental contamination, the instruments are packed in proper wrapping material before sterilization[25]. Kumar et al[22] reported that only 11.6% of final year and only 8.3% of third year students used plastic wrapping before the sterilization of instruments in comparison to our study in which 66.6% and 33.3% respectively did the identical practice. In another study by Singh et al[26] 94.3% of undergraduates used autoclave for sterilization as compared to our study in which only 27.46% used autoclaves.

All sharp objects should be disposed of properly in safe, punctured proof containers[27,28]. In the present study, about 44.8% of dental students used containers for sharp instruments which is in accordance with previous study[19] and Kumar et al[22].

Several studies reported that contamination of dental clinics can be reduced by using high-volume suction[7,29,30]. Kumar et al[22] reported that 56.5% of final year students changed saliva ejectors which is in

accordance to our study which is 50.8% but a significant difference when compared to third year students which is 81.9% and 49.1% respectively.

Ryan et al[31] stated that in his study rubber dam was used by 98.5% of undergraduates as to prevent cross infection which is in contradiction to our study and Al Kholani[32] which is only 15.8% and 3.9% correspondingly (table 1). This vast difference could be because of lack of knowledge on the importance of using rubber dam.

Changing burs and extraction instruments between patients was practiced by 88% and 85% respectively by undergraduates in a study of Al-Kholani[32] and in this study it was implemented by 48.6% and 81.7% students respectively.

A study showed that dentists with ten or more years of experience were significantly more familiar with infection control procedures than the undergraduate students of dentistry[33]. Another study explained that dental professionals above 40 years of age were more prone to utilize specific infection control methods than the dentists who were below 40 years[34]. The data in the study were self reported, and it is important to be vigilant in interpretation of results. In this study we also observe that senior students were significantly familiar enough with infection control procedures.

CONCLUSION

Our observations indicate a lack of understanding of the basics of infection control and the prevention of transmission of communicable infectious diseases. However final year students display more protocol in regard to infection control regime as compared to third year students.

Recommendations: It is necessary to effectively communicate to students the associated risks and importance of transmission of infectious diseases and exposures during dental treatments. Efforts are needed to improve attitudes to implement information and motivate students in the correct and routine use of infection control measures. With all infection control protocols already implemented in dental schools the challenge remains on improving compliance with infection control recommendations. In addition courses and workshops on infection control techniques should be conducted in order to implement knowledge into practice.

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