

Research Article

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Control of Cross Infection at Dental Clinic – A Survey

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ABSTRACT

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The concept of sterilization in the medical field had brought down the mortality and morbidity rate. Yet strict practice of disinfection remains questionable, either due to ignorance or negligence. Thus the study focused on the dental student population to assess their knowledge regarding the practice of infection control. The aim of the present study was to analyze the knowledge regarding control of cross infection among dental students of Pondicherry. Its study design was a Questionnaire Survey and included 120 dental students from Indira Gandhi Institute of Dental Sciences, Pondicherry. A questionnaire related to cross infection from the dental healthcare worker to the patient, between the patients and from the patient to the dental healthcare worker, was distributed to the students and their level of knowledge and practice of infection control was assessed. In our study more than 90% of the students were aware about the need for medical history, Personal protective equipment, waste management, however the awareness regarding sterilization and disinfection was between 70 and 80%. Thus, the dental students at Indira Gandhi Institute of Dental Sciences, Pondicherry reveal varying degree of knowledge regarding the infection control practices; however more awareness program is required to improve the quality of practice.

Introduction

The concept of sterilization in the medical field had brought down the mortality and morbidity rate. However strict practice of disinfection remains questionable, either due to ignorance or negligence. Unlike other body parts, oral cavity is in constant relation with atmosphere that contains variety of

microbes. The dental unit and the associated treatments provide a rich source of microbial environment, establishing an equal chance for everyone at dental office to contract the infection. Hence in our study, we focused on the student population to assess their knowledge regarding the practice of

infection control so as to assess if any additional attention in this aspect is required.

Materials and Methods

The study sample comprised of 120 dental students attending the outpatient department in Indira Gandhi Institute of Dental Sciences, Pondicherry. After obtaining approval from the institution, a questionnaire comprising of 19 self administered close ended questions was distributed to the students who were available on the day of survey. The participants were informed about the study in detail and were asked to mark the right answer whichever they felt was correct and were also asked not to get into any kind of discussions among their fellow mates. A sample questionnaire is given in Table 1.

Results and Discussion

The filled questionnaire was collected from the students and analyzed. Out of 120 students 99.16% reported that record of previous medical history is needed. Eighty percent of the students considered that washing hands is a must before and after wearing gloves and 94.16% before examining a patient.

About, 94.16 %, 95%, 96.66%, 96.66%, 95% and 95.83% of the students considered Eye guard, Gowns/ aprons/lab coat, Gloves, Face mask, Head cap and all the above mentioned items were considered as Personal Protective Equipment for health care providers in the respective sequence. 96.66% students believed that Gowns/ aprons and eye protection guards from the splashes and sprays of blood or body fluids. All the students thought that Gloves and mask prevents infection to health care provider while 82.5% of the students believed that they also prevent infection to the patient.

About 98.33% of the respondents opted for change of gloves after each patient. 80.83% of students mentioned that face mask should be changed between patients and 81.66% stressed upon the use of disposable paper towels. About 36.66%, 14.16%, 71.66%, 96.66% reported that operative instruments that should be changed between the patients are in the order of burs, extraction instruments, hand piece, saliva ejectors. All of them deemed that autoclave is the best mode of sterilization while 85% believed in disinfecting solutions, 78.33% in hot water, 71.66 % in detergent and 78.83% students believed in all of the above. 83.33% of the students considered that sterilized instruments should be maintained in plastic wrappings. When enquired about the equipments that require disinfection, Instruments tray and dental chair was given the maximum rating with 92.50% and 90% respectively, 87.50% to dental impressions, 80.83% to air/water syringe, 78.33% to focus light handle and extraction instruments, 76.66% to hand piece, 74.16% to spittoon and suction hose with least importance to dental burs taking up only 70.83%.

Nearly 75% of the study population considered application of rubber dam is a must in conservative and endodontic dental procedures. Regarding the knowledge about wastes about 94.16% were aware about the categories of waste segregation. But the clarity about biomedical waste, anatomical waste and general waste was lagging at about 16.66%, 13.33%, and 10% in the respective order. 94.16% of the students ensured that special container is a must for each category of waste.

Ninety percent of the students deemed regular cleaning of Wall, floor and carpets. 86.66%, 67.50% mandated that blood and body spills should be cleaned with

disposable cloth and disinfectant respectively, 96.66% of the students responded positively to vaccination of all the health care personals regularly.

To attain best of prognosis in the course of disease process, practice of asepsis is mandatory. Microorganisms in the oral cavity are mostly normal commensals, which takes a lead role under favorable condition causing infection. Dental Health professionals constantly handle the most infectious saliva and blood (Emir *et al.*, 2009), hence they must be adequately equipped to abstain from being infected. Before any treatment protocol is been carried out, a thorough medical records of the patient is mandatory to avoid unwanted consequences. In our study about 99% of dental students enquired about patient's previous medical history.

Before starting with any dental procedure (examination / non-surgical / surgical) it is compulsory to get rid of the colonizing micro flora that resides on the superficial layers of the skin, this can be accomplished by routine handwash with plain or antimicrobial soap and water or alcohol-based hand rub (William *et al.*, 2003).

In this study 80% of the respondents adhered to the protocol of washing hands before and after wearing the gloves and 94.16% washed their hands before examining the patients, whereas a study by Abhinav Singh *et al.* (2011) only 39.2 % of their respondents used washed their hands before and after patient examination.

The Centre for Disease Control (CDC) recommends that gloves, surgical mask, protective eyewear, protective clothing (e.g., gowns and jackets) be used as Personal Protective Equipments (PPE) for a dental professionals (William *et al.*, 2003)

especially when using high-speed rotary instruments (Mehrdad *et al.*, 2009) which splashes blood and saliva all around. In the present study, around 95% of them reported to have adhered to the CDC guidelines of PPE including the usage of headcap, while a study on the Turkish population revealed 96.30% of the dentists preferred to use barrier techniques such as gloves, masks (Emir *et al.*, 2009) and an another study showed that 67.5% of respondents always wore lab coat, 68.9% always used safety glasses, 41% reported to have used protective eyewear, 93.2% used facemask and almost 100% of respondents reported always to have worn gloves (Tracy *et al.*, 2005).

A study by Abhinav Singh *et al.*, reported that 69.8% of their study population used face mask and gloves as an infection control measure (William *et al.*, 2003).

PPE benefits both the patient as well as the dentist and even if they are not able to do all that is enlisted in PPE, the dentist should at least change the gloves and facemask between the patients. In the present study 98% of the students were reported to change their gloves and only 80.83% changed the gloves and facemask between the patients, while a study revealed that 38.5%, of the respondents changed face masks after each patient glove (Tracy *et al.*, 2005). In a national survey of Canadian dentists, only 70% dentists used the basic barriers (gloves, masks, eye protection) (Jawdekar, 2013).

Apart from PPE the operative instruments also should be changed between the patients to avoid cross infection between the patients. Among the various categories of instruments 96.66% of them deemed the change of saliva ejectors with least importance (14.16%) to extraction instruments.

Table.1 Estimates of the Knowledge and Practice of Disinfection among Dental Students

S.No.	Questions
1.	Record of previous medical history is needed.
2.	Washing hands is necessary
	a) Before wearing gloves
	b) Before examining a patient
3.	Which of the following is <i>Personal Protective Equipment</i> in terms of health care provider
	a) Eye guard
	b) Gowns/ aprons/lab coat
	c) Gloves
	d) Face mask
	e) Head cap
	f) All of the above
4.	Gowns/ aprons and eye protection guards from the splashes and sprays of blood or body fluids
5.	Gloves and mask prevents infection to health care provider
6.	Gloves and mask prevents infection to the patient
7.	Change of gloves is warranted after each patient
8.	Face mask should be changed between patients
9.	Use disposable paper towel for placing the operative instruments
10.	Operative instruments that should be changed between the patients
	a) Burs
	b) Extraction instruments
	c) Hand pieces
	d) Saliva ejectors
11.	Which one of the following is effective way of sterilization?
	a) Use of autoclave
	b) Disinfecting solutions
	c) Hot water
	d) Detergent
	e) All of the above
12.	Sterilized instruments should be maintained in plastic wrappings
13.	Which of the following requires disinfection
	a) Dental chair
	b) Air/Water syringe
	c) Spittoon
	d) Suction hose
	e) Hand piece
	f) Focus light handle
	g) Instruments tray
	h) Dental impressions
	i) Extraction instruments
	j) Surgical instruments
	k) Burs
14.	Application of rubber dam is a must in conservative and endodontic dental procedures.
15.	Waste is divided into three categories; general, biomedical and pathological
16.	Special container should be used for disposal of each category of waste
17.	Wall, floor, carpets should be cleaned regularly
18.	Blood/body spill should be cleaned with
	a) Disposable cloths
	b) Disinfection with disinfectant
19.	All health care personnel should be vaccinated for communicable diseases regularly

It is impossible to use disposable instruments for every patient as they are not cost effective, however re-usage can be advocated if they are thoroughly cleaned and sterilized. According to CDC, the operative instruments are categorized based on their penetration ability (Critical, Semi-critical, noncritical items) and the mode of sterilization varies for each group. Critical items that penetrates the hard and soft tissue must be sterilized by heat, Semi-critical items just the touch intact / non intact mucous membranes hence it should be heat sterilized or disinfected at a high level, noncritical items are those that just contacts the skin hence they should be disinfected. The equipments that undergo sterilization should be well packed (William *et al.*, 2003). 94% of the Kuwaiti dentists used autoclave for sterilization (Morris *et al.*, 1996). Whatever is the category of the instrument, heat sterilization and disinfecting solutions remains the most effective method of sterilization. In our study 100% of the students opted for autoclave and 85% consider disinfecting solutions. About 83.33% warrants the need for maintaining the sterilized equipments in plastic wrappings.

With regards to disinfection at dental setup, 90% of the present study group stressed upon disinfecting the dental chair, 92.5% on instrument tray, 70–80% on air/water syringe, hand piece, suction hose, spittoon, focus light handle, dental impressions, burs and surgical instruments. In a previous study, 91.4% of the study group believed in disinfection of the dental chair, clinic, and dental office (Abhinav Singh *et al.*, 2011). It has been reported that the major source of infection either bacterial or viral is through biofilms that form in the waterlines, suction pipes and hoses, hence these water connections must be regularly checked (William *et al.*, 2003). Rubber dam

application is also effective barrier in infection control.

The premises in which the dental procedure is been carried out also must be thoroughly cleaned regularly to get rid of infection at primary level. Around 91.66% the participants in our study deemed that the floor, wall and carpets must be cleaned regularly.

Nearly 94.16% of the dental students were aware about the category of the waste materials and their management. However the awareness regarding blood/body spill was highly lacking.

Dental professionals handling sharp equipments are in constant contact with highly infectious blood and saliva. Hence prevention of communicable disease can be accomplished by prior vaccination. In our study 96.66% of the students deemed that all the dental health care professionals must be regularly immunized with appropriate vaccines. A study conducted in Ontario revealed that all of the dental students were aware about immunization (Mc Carthy *et al.*, 2000).

In conclusion, the compliance regarding the knowledge of infection control is comparatively better than similar other studies that had been carried out, which clearly portrays the awareness towards the protocols available. However, it had not reached all of the student population. Though, the teaching curriculum includes effective training program, the implementation at the clinical setup is still deficient.

In the field of dentistry, it not only the dental professional being victimized by endangering infections like HIV but also the patients are vulnerable. So the program of

infection control has to be stressed periodically and must be monitored by a governing body at each locality.

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