Research Article

KNOWLEDGE, ATTITUDE AND PRACTICES OF INFECTION CONTROL PROTOCOL AMONGST DENTAL POSTGRADUATE STUDENTS IN A DENTAL COLLEGE IN PUNE, INDIA- A CROSS-SECTIONAL QUESTIONNAIRE BASED STUDY

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ARTICLE INFO

ABSTRACT

Aim: To assess the knowledge, attitude and Practices of Infection Control Protocol amongst Dental Postgraduate Students in a Dental College in Pune, India- A cross-sectional Questionnaire based study.

Material and Method:

Study design-

A cross sectional study was carried out using a closed ended, self-administered questionnaire consisting of 15 questions in a dental college in Pune, Maharashtra. In all 35 of the 43 post graduate students of the dental college participated in the study giving a response rate of 81.40%

Results: The responses received was entered into an Excel spreadsheet, knowledge based questions were analyzed and scored as '**1**' for each correct answer and mark '**0**' for each wrong answer as per the responses obtained.

Mean and standard deviation of the total knowledge scores was analysed. The result was analyzed using the Statistical Package for the Social Sciences (SPSS; Version 17.0 for Windows 7 OS, SPSS Inc., Chicago, IL).

Conclusion: Within in the limitations of the present study it can be concluded that the knowledge of the PG students regarding the infection control is poor, especially regarding the waste disposal.

INTRODUCTION

Infection Control are words more to be implied in our dental practice practically than to be just knowing them as words of English Literature and admiring them.We as dental surgeons are solely responsible if an untoward incidence happens to a patient who walks into the clinic to cure his/her problems and goes out with an additional problem. This may be solely because of our negligence due to lack of knowledge in the field of hygiene/infection control or we being careless and not following it. What is infection control in dental practice? This question may be answered by most of the dentists. But if a question is framed how many follow it religiously in their practice? The answer would be very few if answered sincerely.

Oral cavity is considered to be a reservoir of a large number of microorganisms. The dental professionals are constantly exposed through the blood and saliva of the patients. The dental field warrants, adequate sterilization and disinfection procedures to be followed in our routine practise, but sadly this appears to be the most neglected step due to a variety of reasons ranging primarily from lack of concern to finances. The importance and need for the adequate sterilization in the light of various transmissible diseases and cross- contamination cannot be ignored (Gupta *et al.*, 2003). Various dental procedures, can lead to the possible transmission of various infections which could occur through direct contact with blood of the patient, saliva or contaminated treatment water from dental units, injury with an needle or splash exposure of the mucous membranes, droplets and aerosols as well as indirect and direct contact with contaminated instruments and surfaces (Rahman *et al.*, 2013). Several recommendations and specific guidelines issued by various medical and dental society are existing but various studies have demonstrated that these are not followed in dental settings and various dental colleges and hospitals (Khanghahi *et al.*, 2013; Yenogopal *et al.*, 2001).Various studies have demonstrated that poor and inappropriate knowledge, attitude and practices regarding the various infection control protocols to be followed in our routine dental practice. (Angelillo *et al.*, 2001; Akeredolu *et al.*, 2006;

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Guruprasad and Chauhan, 2011). The present study was conducted to assess the knowledge, attitude and practices regarding the various infection control procedures followed by post graduate students in a dental college in Pune, India as it is thought to be the right time to nurture these protocol in their routine academic years of their study which may become a routine practice when they complete their course and start their practise. This may lead to decrease in the unwanted circumstances due to improper following of infection control protocols.

MATERIAL AND METHODS

Study design: Cross-sectional questionnaire based study.

Source of data/study population: All the PG students of Dental College and Hospital in Pune, India.

Selection Criteria

- Inclusion criteria

All Post graduate students present in dental college.

- Exclusion criteria

Post graduate Dental students were given a choice and those who do not want to participate voluntarily were excluded from the study and those were not present on the day of the study were also excluded.

Sampling procedure: Census sample.

Sample size: 43

Data collection procedure: All the PG students were asked to assemble in a specified classroom. The date of the study to be conducted was told to them and their respective head of department (HODs) well in advance so that they could schedule their patients and other academic work accordingly. Before giving the questionnaire the principle investigator briefed them about the study and those willing to participate after hearing the instructions were given the questionnaire. The self-completed questionnaire was collected back from the students immediately on completion. In all only 35 out of a total of 43 PG students were present for the study and these were included in the study.

The questionnaire was adopted from a study done by (Gupta *et al.*, 2003). The questionnaire was slightly modified to meet the needs of this present study.

Section A assessed the demography of the respondents- gender, age, year of education.

Section B was made up of questions to assess the knowledge attitude and practices of PG Student hospital about maintaining sterilization and infection control.

The questions based on knowledge were questions number 14 and 15. Question 14 assessed the knowledge regarding methods to sterilize various instruments and materials used in dental practice. This had seven items to be answered as subparts. The question number 15 assessed the knowledge regarding the use of coloured bags for proper waste disposal which assessed knowledge based on five items asked. The 12 sub-questions combined together (of questions 14 and 15) assessed the knowledge of the participants. For each correct answer, a score

of 1 was awarded. The total knowledge scores of the students were assessed on a scale of 0-12. For analysis purpose each subpart was considered as an individual question. Individuals obtaining a score of 10 and above (which is above 75%) was rated as good, individuals with scores between 7-9 (which is equal to 58.3% -75%) was rated as fair and individuals with scores less than 7 (less than 58.3%) was rated as poor.

Statistical procedure

The responses received was entered into an Excel spreadsheet, knowledge based questions were analyzed and scored as '**1**' for each correct answer and mark '**0**' for each wrong answer as per the responses obtained.

Mean and standard deviation of the total knowledge scores was analysed. The result was analyzed using the Statistical Package for the Social Sciences (SPSS; Version 17.0 for Windows 7 OS, SPSS Inc., Chicago, IL).

RESULTS

A Study was conducted to assess the knowledge, attitude and practices in the PG students in a Dental College and Hospital in Pune, India regarding sterilization and infection control.
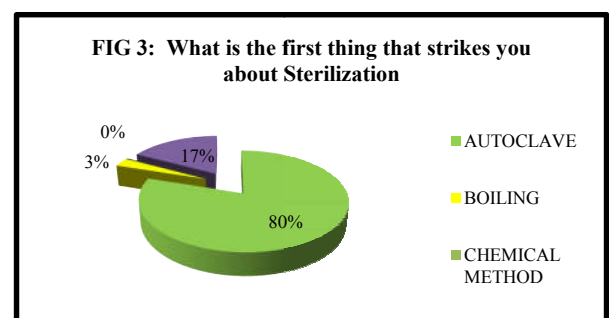
In all **35 PG students** participated in the study out 43 PG students giving a response rate of 81.40%. The results are presented as graphs.
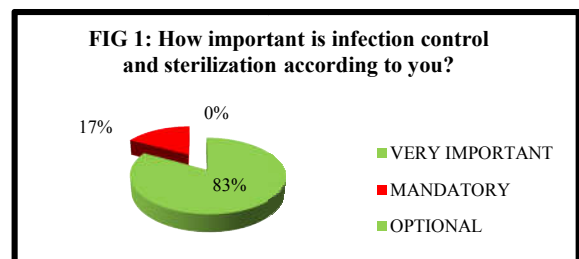
Q1. How important is infection control and sterilization according to you?
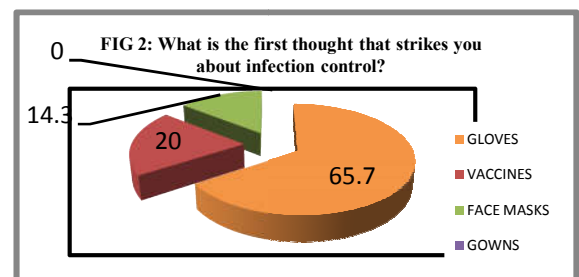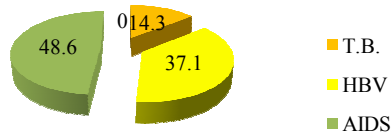

Q2. What is the first thought that strikes you about infection control?

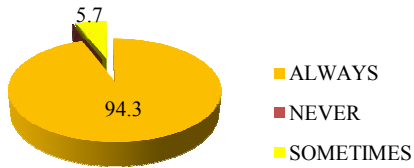**Q3.** What is the first thing that strikes you about Sterilization?

FIG 4: What is the first thought when you think of transmissible disease?

0 14.3
48.6
37.1

- T.B.
- HBV
- AIDS

Q4. What is the first thought when you think of transmissible disease?

FIG 5: When you work on patients, do you remove your rings, watches, other religious ornaments?
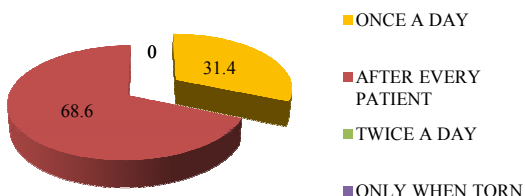
5.7
94.3

- ALWAYS
- NEVER
- SOMETIMES

Q5. When you work on patients, do you remove your rings, watches, other religious ornaments?

FIG 6: How often do you change your mask?

2.9
20
34.3
42.9

- ONCE A DAY
- AFTER EVERY PATIENT
- TWICE A DAY
- ONLY WHEN TORN
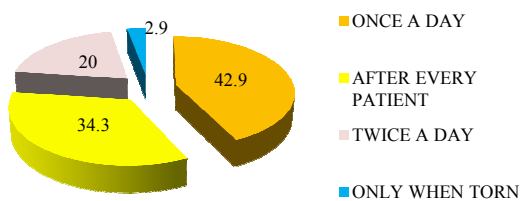
6. How often do you change your mask?

FIG: 7. How often do you change your gloves?

0 31.4
68.6

- ONCE A DAY
- AFTER EVERY PATIENT
- TWICE A DAY
- ONLY WHEN TORN

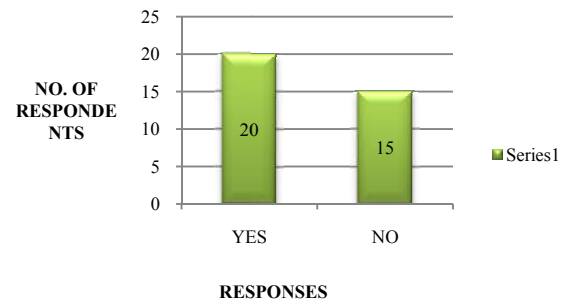**7.** How often do you change your gloves?

FIG 8: Do you check for the reliability of the sterilization?

NO. OF RESPPONDENTS
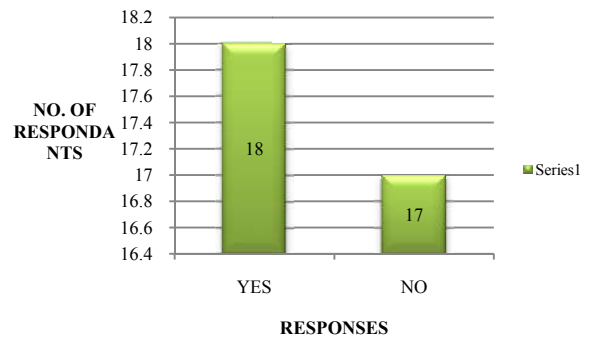
24 (YES) 11 (NO)

RESPONSES

- Series1
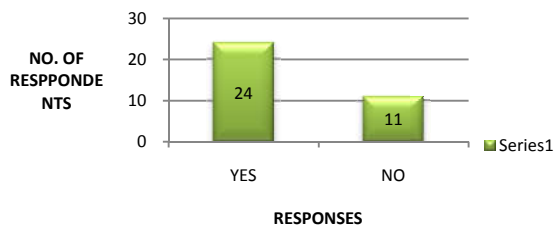
8. Do you check for the reliability of the sterilization?

FIG 9: Do you disinfect your Dental Chair ?

NO. OF RESPONDENTS

20 (YES) 15 (NO)

RESPONSES

- Series1

9. Do you disinfect your Dental Chair?

FIG 10: Do you disinfect your operating stool?

NO. OF RESPONDANTS

18 (YES) 17 (NO)

RESPONSES

- Series1

Q10. Do you disinfect your operating stool?

FIG11: Do you disinfect your vicinity of operating area?

NO. OF RESPONDANTS

28 (YES) 7 (NO)

RESPONSES

- Series1
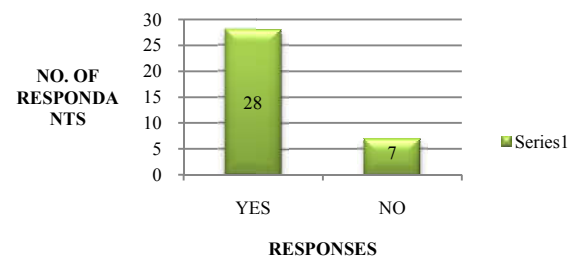
Q11. Do you disinfect your vicinity of operating area?

FIG 12: Do you inform the patient regarding the risk of getting infection before the treatment procedure?
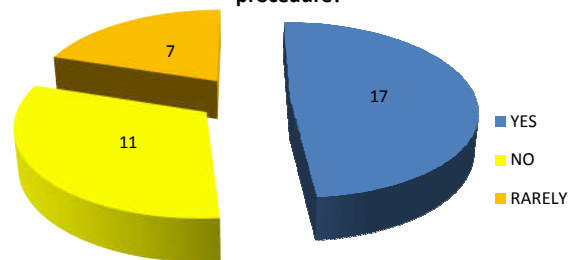
7
11
17

- YES
- NO
- RARELY

Q12 Do you inform the patient regarding the risk of getting infection before

FIG13: Do you enquire about the patients profession, drug usage, systemic diseases etc?

Q13. Do you enquire about the patients profession, drug usage, systemic diseases etc?

Q.14 How do you sterilize the following instruments?

15. Which coloured bags do you dispose the following

For disposal of mercury waste most of the respondents (18) were unaware of the method of disposal

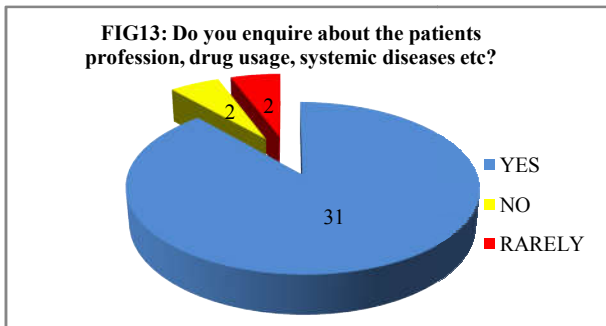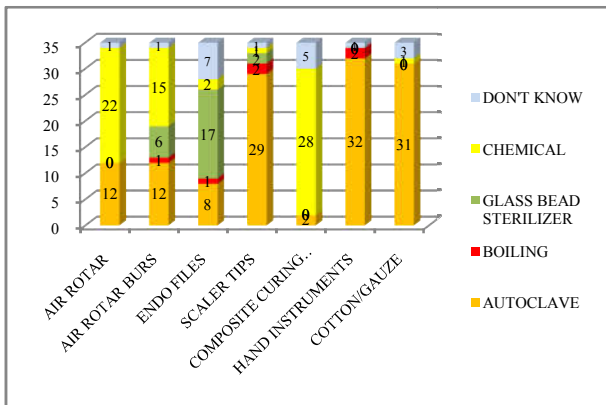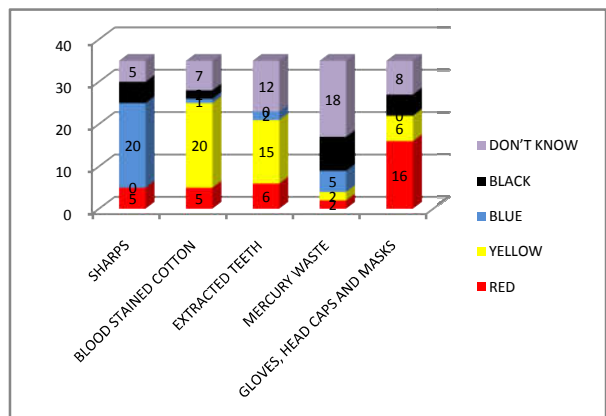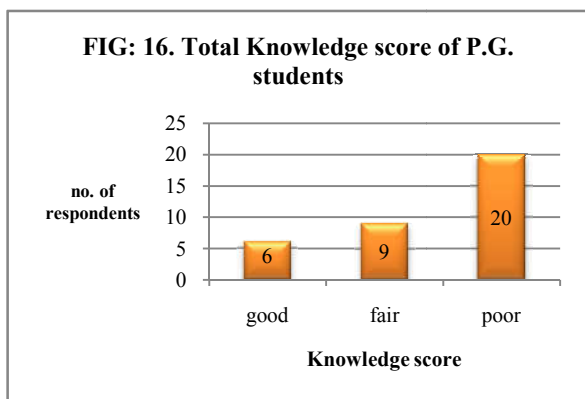**FIG: 16. Total Knowledge score of P.G. students**

Assessing the total knowledge score it was observed that only **6** of the study subjects had **good** knowledge score followed by **9** study subjects who had **fair** knowledge score whereas **20** study subjects had **poor** knowledge score of sterilization and infection control. The mean knowledge score of the study subjects was 6.42 $\pm$ 1.97.

DISCUSSION

A questionnaire based study was carried out to assess the knowledge, attitude and practices of the PG students in a dental college in Pune.

It was found from our study that 83%of the subjects considered sterilization and disinfection as very important and 17 % considered it as mandatory. These results are not in consensus with the study done by (Gupta *et al.*, 2003) in which 62% of the respondents considered it as mandatory. The study revealed that first thing that strikes about the infection control was gloves 65%, vaccines 20% and facemasks 14% , these results showed a similar pattern in percentages in a study done by (Gupta *et al.*, 2003) in which it was 73%, 16%,10% respectively. This may be a matter of concern as Face masks play a important role in preventing against infection control. The dental procedures like cavity preparation, oral prophylaxis warrants the use of air rotors and scalers which generates substantial amount of aerosols. Hence masks should not be under estimated. It is recommended that a new mask be worn for each patient and that masks be changed routinely, at least once every hour and more often in the presence of heavy aerosol contamination (Fiehn *et al.*, 1988).

Our study revealed that that the first thing that strikes about the sterilization was autoclave (80% respondents). Our results are not in consensus with the study done by (Gupta *et al.*, 2003) in which it was mere 1%.

Regarding transmissible disease it was found that 48.6% thought AIDS as first thought followed by HBV (37.1%). Similar pattern was seen in study done by (Gupta *et al.*, 2003) in which it was 60% for AIDS and 38% for HBV. Pre exposure hepatitis B vaccine and the use of standard precautions to prevent exposure to blood are the most effective strategies for preventing DHCP from occupational infection with HIV, HBV or HCV. (Cleveland and Cardo., 2003).

Question regarding removal of rings and ornaments revealed that 94.3% said that they removed the religious ornaments where as 5.7%said that they sometimes removed it. (Field *et al* 1996) in a study concluded that effective hand disinfection is difficult to achieve if rings and watches are not removed ;they should therefore be removed prior to hand disinfection and donning of the gloves.

Question regarding the frequency of changing the face masks revealed that only 34.3% of them changed the masks after every patient. (Cottone *et al.*,1995) suggested that a new mask be worn for each patient and that masks be changed routinely, at least once every hour and more often in the presence of heavy aerosol contamination. (Bailey *et al.*, 1968) conducted a study to evaluate the efficiency of disposable face masks in reducing the potential microbial contamination of the dentists by the aerosol generated by high speed drill. Results of the study showed that although the face masks vary in their

screening ability, they are significantly effective in reducing the hazards of the contamination.

Question regarding frequency of changing the gloves it was seen that 68.6 %changed gloves after every patient compared to 31.4 % who responded that they changed once day. This is matter of concern as it should be made a protocol to change the gloves after every patient. Our results are not in consensus with the study done by (Gupta *et al*., 2003) in which it was found that only 27% of the study subjects changed the gloves after every patient. (Saglam and Sariyaka, 2000) in their study found out 48.5% always used gloves and 77.3% of those using the gloves changed them after every patient. Further it is beneficial to wash hands before gloving the hands as it further reduces the chances of cross infection (Micik *et al.*, 1971).

It was seen that only 24 of the study subjects checked for the reliability of the sterilization procedures carried out which is similar to study done by (Gupta *et al*., 2003). Monitoring of sterilization procedures should include a combination of process parameters, including mechanical, chemical, and biological. **Mechanical techniques-** for monitoring sterilization include assessing cycle time, temperature, and pressure by observing the gauges or displays on the sterilizer and noting these parameters for each load. **Chemical indicators**- internal and external, use sensitive chemicals to assess physical conditions (e.g., time and temperature) during the sterilization process. Although chemical indicators do not prove sterilization has been achieved, they allow detection of certain equipment malfunctions, and they can help identify procedural errors. **Biological indicators (BIs)-** (i.e., spore tests) are the most accepted method for monitoring the sterilization process because they assess it directly by killing known highly resistant microorganisms (e.g., *Geobacillus* or *Bacillus* species), rather than merely testing the physical and chemical conditions necessary for sterilization. (Centres for disease control and prevention 2003).

Questions regarding disinfecting dental chair, operating stools and the vicinity of the operating area showed the results that most of the study participants did follow the disinfection procedures. Our results are not in consensus with the study done by (Gupta *et al*., 2003) in which it was seen that majority of the subjects followed the protocol.

Most of the students did inform the patients regarding the risk of getting infection before starting of the treatment. This is a good practice and should be followed. A complete medical history should always be obtained. Specific questions about lymphadenopathy, recent weight loss, and infections should be included. All positive responses should be followed up. An individual may not be aware of an infectious state, so diagnostic acumen may be required (Gluck and Morgasnstein, 2003).

Questions relating to knowledge ie. Questions 14 and 15 with their subparts showed that the most of the students did not fare well and obtained a score of 50% and less than 50%. These questions were based on sterilization of various dental instruments and materials and proper disposal of waste generated during the various procedures undertaken. Common instruments used in dentistry such as air rotor, burs, scalar units endo-files and hand instruments can be potential source of infection if infection control practices are not followed. Proper

training of the PG students in this field may perhaps give a better score of the answers received from the participants to questions 14 and 15. It was observed that disposing the mercury waste yielded the maximum wrong answers with 18 of the subjects not knowing the correct answers and rest attempting it wrong.

CONCLUSIONS AND RECOMMENDATIONS

Within in the limitations of the present study it can be concluded that the knowledge of the PG students regarding the infection control is poor, especially regarding the waste disposal. This is a serious matter of concern as improper disposal of waste specially the mercury waste may be harmful to the environment. This study warrants other studies to be carried out on a larger scale to assess the knowledge, attitude and practices not only in the PG students but also in the entire dental fraternity.

It is recommended seeing the results of the study that

- Proper training of the students be carried out in the form of Lectures, conference and CDE programmes.
- Under no situation any laxity in the infection control procedures be allowed.
- Infection control practices should be monitored religiously by all the departments.
- Dental Council of India (DCI) and Medical Council of India (MCI) should consider special lecture series to be incorporated in the syllabus.

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