

Knowledge, Attitude and Practice of General Dentists towards Sterilization of Endodontic Files: A Cross-Sectional Study

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Abstract

Background: Root canal treatment is performed with the help of various endodontic instruments which were often reused. These instruments have to be cleaned, disinfected and sterilized effectively. The present study was done to evaluate the knowledge, attitude and practice of the general dentists towards sterilization of endodontic files. **Materials and Methods:** Total 102 general dental practitioners including master's degree in various specialty of dentistry excluding endodontist were taken in the study. Specially prepared questionnaires consisting of 11 questions were used in the study. The results were tabulated and analyzed with the help of IBM SPSS statistics 20 using student's t test. **Results:** The general dental practitioners were having less knowledge, attitude and practice towards sterilization of the endodontic instruments as compared to that of the dental practitioners with master's degree and the difference was found to be statistically significant. (Student's t test). **Conclusion:** Many of the dental practitioners were not following the basic protocols of the sterilization. There is a need to increase the awareness of the sterilization of the endodontic instruments as it can be highly contagious.

Keywords: Dental Infection, Endodontic Files, Sterilization

1. Introduction

Various types of the human microbial pathogens have been isolated from the oral secretions, which evidences the occupational potential for the disease transmission. Dental healthcare practitioners are always at an increased risk for cross infection and transmission of disease from one patient to another patient¹. This can occur by direct exposure or via contaminated instruments or surface. Blood and saliva have been found to be high-risk sources for contracting hepatitis B, human immunodeficiency virus and herpes².

Endodontic treatment involves cleaning and shaping of the root canals as an important phase. This can be performed with the help of hand and rotary instruments which are usually reused. Since endodontic treatment involves accumulation of the debris on the flutes of the

files, these endodontic files have to be cleaned, disinfected and sterilized very effectively^{3,4}.

During endodontic instrumentation types of debris like vital and necrotic tissue, dentin chips, bacteria, blood, blood by products or other potential irritants are often encountered. The transfer or exchange of this type of debris from patient to patient is highly undesirable as they often act as an antigen, infecting agents or non-specific irritants transmitting certain lethal disease like Creutzfeldt-Jacob disease^{3,4}.

Different types of methods have been proposed for the cleaning and sterilizing the endodontic files including use of sponges and brushes, ultrasonic cleaning, glutaraldehyde solution, sodium hypochlorite, glass bead sterilizer, dry heat and also use of steam sterilizer with or without use of the chemicals. Cleaning the hand instruments with

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ultrasonic cleaner has been found to be superior to the other methods of cleansing and debriding^{3,4}.

Various types of diseases can be transmitted by indirect contact when endodontic files contaminated are use from one patient to another patient without proper disinfection or sterilization between uses⁵.

This study was done to evaluate the knowledge, attitude and practice of the general dental practitioners towards sterilization of the endodontic files.

2. Materials and Methods

A cross sectional study was performed consisting of general dental practitioners. Ethical committee approval was taken from the concerned authority before the start of the study and informed consent was taken from all the participants.

The study was done with the use of specially formulated questionnaires. First pilot study was carried out to test the validity of the questions. The questionnaires were distributed to the nearby general practitioners by hand and their responses were collected and entered in a prescribed format. Privacy of the responses given was guaranteed and the results were kept confidential.

Total 11 questions were selected (Table 1). Each correct answer is given a score 1, while incorrect answer given score zero. The study was consisted of 102 general practitioners, out of which 32 were having master degree in any of the specialty of dentistry except endodontics.

2.1 Inclusion Criteria

The dentist must be doing general dental practice.

2.2 Exclusion Criteria

Dentists with Master degree in endodontics.

Dentists not willing to participate in the study.

3. Results

All the scores of the participants were collected and statistical analysis was done. It showed that the general dental practitioners had less knowledge, attitude and practice towards sterilization of the endodontic files as compared to that of dental practitioners with master's degree and the difference was found to be statistically highly significant. (Student's t test, $p < 0.001$) (Table 2, Figure 1).

Table 1. Questionnaires used for the study

Sl. no.	Questions
1.	Do you sterilize instruments in your clinic after every use in patient? Yes. No.
2.	Do you sterilize endodontic instruments in your clinic? Yes. No.
3.	Do you use disinfectant in your clinic? Yes. No.
4.	Is disinfection procedure followed in your clinic? Yes. No.
5.	If you sterilize endodontic instruments like root canal files. How do you sterilize it? Using glass bead sterilizer or using chemical. Using spirit.
6.	Do you use sterilization pouch for instruments packing after sterilization? Yes. No.
7.	Do you use hand sterilization agent sterilium after attempting the patient? Yes. No.
8.	Do you sterilize files between two teeth of same patient? Yes. No.
9.	How do you clear off the debris after use of files in patient? Wipe with spirit. Ultrasonic cleaner.
10.	When will you sterilize the instrument after use? After each canal is prepared. After all canals are prepared.
11.	Do you sterilize new endodontic files before use in patient? Yes. No.

4. Discussion

Infection control is consisted of various actions to prevent further spread of infections. Important issue is that they should be simple, practical and understandable and could be

Table 2. Comparison of the scores of the general dental practitioners and practitioners with various master's degree excluding endodontics (Student's t test)

Group	N = number of participants	Mean $\pm$ SD	T value	Significance
General dental practitioners	70	5.42 $\pm$ 1.34	5.674	P<0.001
Dentists with master's degree	32	7.27 $\pm$ 2.21		

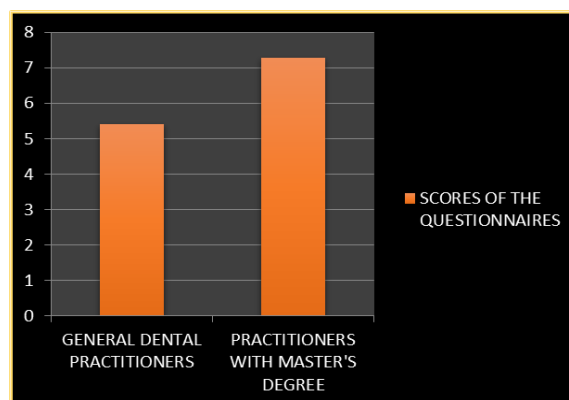


Figure 1. Comparison of the scores of the questionnaires between general dental practitioners and practitioners with master's degree.

easily done by dental assistant⁶. Sterilization is a process to render an object free from viable organisms including bacterial spores and viruses. So, sterilization is an “all-or-none” phenomenon³. The basic principles of asepsis and infection control are: Use of gloves, protective eye wear, plastic aprons, use of properly disinfected and sterilized instruments, proper disposal of sharps and infected waste material⁷.

Dental environment often includes physical, chemical and biological risks, both to the professionals and the patients. A biological risk consists of contamination by microorganisms on equipment, materials or instruments used in the clinical practice. This makes occupational infections and cross infections possible if not properly prepared and disinfected before use¹.

While doing root canal treatment this type of cross infection can occur through endodontic instrumentation like endodontic files. These files often become coated with vital and necrotic tissue, dentin chips, bacteria, blood by products or other types of potential irritants. These heavily contaminated or soiled instruments may present a challenge

to all practical methods of disinfection or sterilization⁸. Due to the design of the endodontic files; it is very conducive for the microorganisms and debris to be anchored into them³.

In the present study we found that most of the general dental practitioners were unaware of the sterilization knowledge. 85% of the practitioners were aware of the fact that endodontic files must be sterilized after preparation of all the canals and not after preparation of the single canal, which was also found in earlier report³, in which 80% dental practitioners had this knowledge.

In earlier study¹ found that 66.7% practitioners follow disinfection procedure in their clinic, which is slightly contrast to our study, where we found that 88.3% practitioners follow disinfection procedures. Also in the present study, we found that sterilization pouch was used by 45.8% of the practitioners, which in contrast to earlier study¹, where only 13.3% practitioners use sterilization pouch.

In our study 62.5% were not sterilizing their new endodontic files before use in patient. Similar findings were also reported⁹, wherein 60% practitioners were not sterilizing their new endodontic files.

Used endodontic instruments must be thoroughly pre-cleaned before sterilization, to remove visible debris by either brushing or ultrasonic cleaning. Endodontic files, as supplied by the manufacturers to the endodontist are not pre-sterilized routinely but recently certain endodontic files have been introduced into practices which are pre-sterile^{10,11}.

We need to sterilize endodontic instruments because microorganisms are the major cause of endodontic disease and therefore an aseptic technique is to be followed instead of knowing all the hazards^{3,5}.

5. Conclusion

This study results showed that the sterilization efforts taken by the dental practitioners were not satisfactory. Some of the dental practitioners were having highly positive attitude and practice of maintaining sterilization of the endodontic files, while others were extremely negative. Motivational program, seminars or workshops should be arranged to increase the awareness of the sterilization of endodontic instruments.

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