

Knowledge, Attitude, Perception On Irrigant Activation Devices Among Specialists And Dental Practitioners

Research Article

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Abstract

Introduction: Irrigation of the root canal space is an essential part of root canal treatment. Procedures for acoustic and hydrodynamic enactment of the irrigant have been created because syringe irrigation isn't powerful in the apical piece of the root canal. It has been shown that acoustic streaming and cavitation add to the cleaning effectiveness of root canal irrigation. Acoustic streaming can be characterized as a quick development of liquid in a vortex-like movement around a vibrating record.

Aim: The aim of the present study is to analyse the knowledge, attitude, perception on irrigant activation devices among specialists and dental practitioners.

Materials and Methods: Self administered questionnaire of close ended questions was prepared and it was distributed among dental students from February to March 2021 through the online survey "google forms". Data was analysed with SPSS version (22.0). Descriptive statistics as percent were calculated to summarise qualitative data.

Results: The questionnaire was distributed among 200 participants. 13.9% of the participants were PG students, 11.4% of the participants were dental practitioners, 73.8% of the participants were Endodontists. 94.1% of the participants were aware of the terminology irrigant activation devices. Pearson chi square test showed P value= 0.239 (<0.05) statistically significant. 80.2% of the participants used sodium hypochlorite as an irrigant, 3.5% of the participants used chlorhexidine as an irrigant, 7.9% of the participants used saline as an irrigant, 7.4% of the participants used sterile water as an irrigant. Pearson chi square test showed P value= 0.834 (>0.05) not statistically significant.

Conclusion: Dental practitioners had overall good knowledge and awareness on the irrigant activation devices. On comparing different education levels, Endodontists had good knowledge and awareness regarding the irrigant activation devices.

Keywords: Awareness; Endodontists; Irrigation; Knowledge; Innovative Technique.

Introduction

Irrigation of the root canal space is an essential part of root canal treatment. Procedures for acoustic and hydrodynamic enactment of the irrigant have been created because syringe irrigation isn't powerful in the apical piece of the root canal. It has been shown that acoustic streaming and cavitation add to the cleaning effectiveness of root canal irrigation. Acoustic streaming can be characterized as a quick development of liquid in a vortex-like movement around a vibrating record [1]. A definitive goal of endodontic treatment is to control the microbial factor in complex

root canal systems, particularly in the apical one third. This goal is accomplished by consolidating instrument-based readiness (manual or mechanical) with sterile watering arrangements followed by three-dimensional obturation of the root canal system [2]. This blend counterbalances the disadvantages of the instrument-based readiness, especially the making of debris and the smear layer [3].

One of the benefits of syringe irrigation is that it permits similarly simple control of the profundity of needle penetration inside the canal and the volume of irrigant that is flushed through the canal. Ideal root canal irrigants should meet all the conditions

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portrayed above for endodontic achievement. In any case, there is nobody interesting irrigant that can meet every one of these necessities, even with the utilization of strategies, for example, bringing down the pH, expanding the temperature, just as expansion of surfactants to build the wetting viability of the irrigants [4]. Root canal irrigation plays an essential part in Endodontics, to encourage instrumentation by lubrication, remove debris, microorganisms, smear layer and prevent apical debris pressing. Irrigants apply their belongings, by mechanical, compound and natural activities. On the mechanical front, streaming powers are conveyed to the canal walls. On the compound front, the dynamic parts apply explicit actions on the natural and inorganic debris [5].

The gold standard irrigant is still sodium hypochlorite, which can be related with EDTA to offer bactericidal, dissolvable, and chelating activities across the board. This combination balances the downsides of the instrument-based arrangement, especially the production of debris and the smear layer. The smear layer is conceivably contaminated, and its evacuation permits more proficient entrance of intracanal drugs into the dentinal tubules and a superior interface between the filling material and the root canal walls [6]. In root canal treatment, irrigant solutions are vital for aid debridement and sterilization, yet their spread and activity is frequently confined by canal systems. Subsequently, initiation of irrigants is recommended to improve their dissemination in the canal system, expanding irrigation adequacy. Enactment can be done with lasers, named laser-activated water irrigation (LAI) [7]. Ultrasonic agitation and pulsed lasers are the two major techniques for activating endodontic irrigation fluids. Ultrasonic agitation enhances performance of irrigants, extrusion of fluids from the root canal during activation. Ultrasonic agitation with piezo-electric devices were used as a moving tip, while laser agitation was used as a stationary tip [8].

Root canal irrigation plays a vital role which facilitates instrumentation by lubrication, removing debris, bacteria and preventing apical debris packing. Irrigant activation is used as a method to agitate and improve flow of irrigants to the intricacies of the root canal system by mechanical forms. Just 1mm beyond the needle tip is the best delivered irrigant in conventional irrigation methods [9]. Surface quality of the tip and cleaning efficiency of the canal are not provided by any existing irrigation activation system [10]. Our team has extensive knowledge and research experience that has translate into high quality publications [11-30].

The aim of the present study is to create knowledge, attitude and perception on irrigant activation devices among specialists and dental practitioners.

Materials and Methods

Study design:

A cross sectional study was conducted through an online survey from February to April 2021 among dental practitioners and specialists.

Study subjects:

A simple random sampling was used to select the study participants.

Inclusion criteria:

All the dental practitioners and specialists who were willing to participate were included.

Ethical considerations:

Returning the filled questionnaire was considered as implicit consent as a part of the survey. Ethical approval for the study was obtained from the Institutional Review Board (IRB), Saveetha Dental College.

Study methods:

Self administered questionnaire of close ended questions was prepared and it was distributed among dental practitioners and specialists from February to April 2021 through the online survey "google forms". The collected data were checked regularly for clarity, competence, consistency, accuracy and validity. Demographic details were also included in the questionnaire.

Statistical analysis:

Data was analysed with SPSS version (22.0). Descriptive statistics as percent were calculated to summarise qualitative data. Chi square test was used to analyze.

The confidence level was 95% and of statistical significance $P < 0.05$. Finally, the result was presented by using bar charts, pie charts and percentage tables.

Results

The questionnaire was distributed among 200 participants. Of the 200 participants, 40% of the participants were male while 60% of the participants were female. 37.5% of the participants belong to the 15-18 years of age group, 24% of the participants belong to the 18-25 years of age group, 38.5% of the participants belong to the above 25 years of age group. 33% of the participants have experience of 0-5 years, 36.5% of the participants have experience of 5-10 years, 30.5% of the participants have experience above 10 years. 14% of the participants were PG students, 11.5% of the participants were dental practitioners, 74.5% of the participants were Endodontists. 95% of the participants were aware of the terminology irrigant activation devices (Figure:1). 81% of the participants used sodium hypochlorite as an irrigant, 3.5% of the participants used chlorhexidine as an irrigant, 8% of the participants used saline as an irrigant, 7.5% of the participants used sterile water as an irrigant (Figure:2). 84.5% of the participants were aware of irrigant which differ based on the pulpal or peri apical diagnosis (Figure:3). 14.5% of the participants were aware that < 30 sec as the duration of irrigation, 79% of the participants were aware that 30 sec- 1 min as the duration of irrigation, 6.5% of the participants were aware that 1-2 min as the duration of irrigation (Figure:4). 87% of the participants were aware when to remove the smear layer. 19.5% of the participants were aware that 1mm from the apical foramen is the depth of penetration of needles for irrigation while 58% of the participants were aware that 2mm from the apical foramen is the depth of penetration of needle for irrigation. 61.5% of the participants were aware that 5-10 ml is

Figure 1. Bar graph showing comparison of responses between different educational levels of undergraduate dental students and awareness of the term irrigant activation devices. X axis represents the irrigant activation devices and Y axis represents the No. of responses. Most of the Endodontists were more aware of term irrigant activation devices (34.52%) and the difference was statistically significant. Chi square test showed p value= 0.852 (>0.05) not statistically significant.

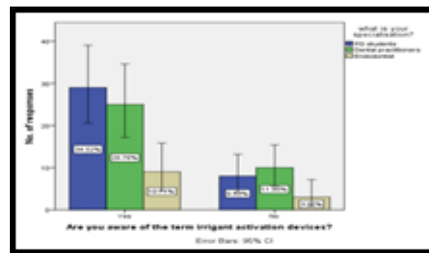


Figure 2. Bar graph showing comparison of responses between different educational levels of undergraduate dental students and awareness of the irrigant used. X axis represents the uses of irrigant and Y axis represents the No. of responses. Most of the Endodontists were more aware of irrigant use (26.19%) and the difference was statistically significant. Chi square test showed p value= 0.834 (>0.05) not statistically significant.

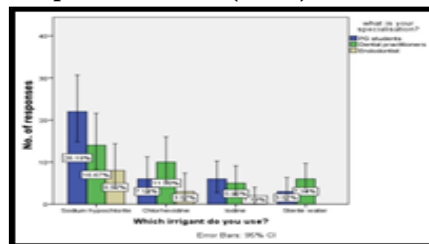


Figure 3. Bar graph showing comparison of responses between different educational levels of undergraduate dental students and awareness of irrigant that differ based on the pulpal or peri apical diagnosis. X axis represents the choice of irrigants and Y axis represents the No. of responses. Most of the Endodontists were more aware of irrigant that differ based on the pulpal or peri apical diagnosis (28.57%) and the difference was statistically significant. Chi square test showed p value= 0.677 (>0.05) not statistically significant.

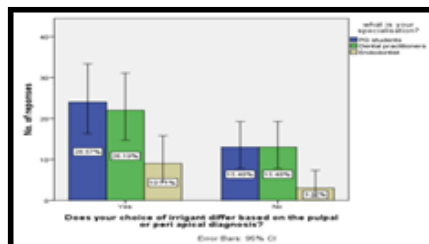


Figure 4. Bar graph showing comparison of responses between different educational levels of undergraduate dental students and awareness of duration of irrigation that is preferred per canal. X axis represents the duration of irrigants and Y axis represents the No. of responses. Most of the Endodontists were more aware of the duration of irrigation that is preferred per canal (19.05%) and the difference was statistically significant. Chi square test showed p value= 0.030 (<0.05) statistically significant.

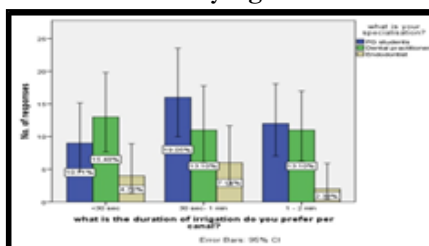
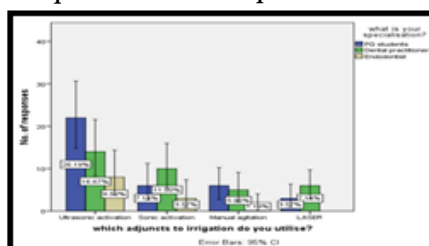


Figure 5. Bar graph showing comparison of responses between different educational levels of undergraduate dental students and awareness of adjuncts utilised for irrigation. X axis represents the adjuncts to irrigation and Y axis represents the No. of responses. Most of the Endodontists were more aware of adjuncts utilised for irrigation (26.19%) and the difference was statistically significant. Chi square test showed p value= 0.000 (<0.05) statistically significant.



the volume of irrigant to be employed per canal while 26.5% of the participants were aware that 0.5ml is the volume of irrigant to be employed per canal. 67% of the participants used ultrasonic activation as the adjuncts to irrigation, 14.5% of the participants used sonic activation, 11.5% of the participants used manual agitation and 7% of the participants used LASER (Figure:5). 62.5% of the participants were aware that antimicrobial action is the advantage of using irrigant activation devices, while 22.5% of the participants were aware that lubricant is the advantage of using irrigant activation devices. 19% of the participants use irrigant for every case, 69.5% of the participants use irrigant for tooth with infection while 11.5% of the participants will not use irrigant at all. 21.5% of the participants would not use irrigant because they think it is not necessary. 72% of the participants would not use irrigant because they don't have knowledge on it.

Discussion

From the present study it was evident that 95% of the participants were aware of the irrigant activation devices. The similar study was done by Madhusudhana Koppolu in which 80.6% of the participants were aware of the irrigant activation devices [31].

In the present study, 33% of the participants have experience of 0-5 years, 36.5% of the participants have experience of 5-10 years, 30.5% of the participants have experience above 10 years. The similar study which was conducted by Madhusudhana Koppolu in which 43.3% of the participants have experience of 5-10 years and 33.3% of the participants have experience of <5 years [31].

In the present study, 81% of the participants used sodium hypochlorite as an irrigant, 3.5% of the participants used chlorhexidine as an irrigant, 8% of the participants used saline as an irrigant, 7.5% of the participants used sterile water as an irrigant. 7.4% of the participants used sterile water as an irrigant. A similar study was performed by Clarkson in which 77.7% of the respondents used sodium hypochlorite as the irrigant while 27.7% of the respondents used chlorhexidine as the irrigant [32]. In contrast, the study performed by Al-Ali in which 92% of the respondents used sodium hypochlorite as the irrigant while 65.03% of the respondents used saline as the irrigant [33]. In contrast, a study which was performed by Shrestha in which 95.8% of the respondents used sodium hypochlorite as the irrigant while 42% of the respondents used chlorhexidine as the irrigant [34]. In contrast, the author Erecan concluded that 94% of the participants have used sodium hypochlorite as an irrigant [35].

In the present study, 14.4% of the participants were aware that < 30sec as the duration of irrigation, 78.2% of the participants were aware that 30 sec- 1 min as the duration of irrigation, 6.4% of the participants were aware that 1-2 min as the duration of irrigation. A similar study was conducted by Madhusudhana Koppolu in which 22.2% of the participants were aware that <30sec as the duration of irrigation, 66.7% of the participants were aware that 30 sec- 1 min as the duration of irrigation, 11.1% of the participants were aware that 1-2 min as the duration of irrigation [31].

In the present study, 19.3% of the participants were aware that 1mm from the apical foramen is the depth of penetration of needles for irrigation while 57.4% of the participants were aware

that 2mm from the apical foramen is the depth of penetration of needles for irrigation. A similar study was performed by Madhusudhana Koppolu in which 11.1% of the participants were aware that 1mm from the apical foramen is the depth of penetration of needles for irrigation while 50% of the participants were aware that 2mm from the apical foramen is the depth of penetration of needles for irrigation [31].

In the present study, 14.5% of the participants were aware that < 30sec as the duration of irrigation, 79% of the participants were aware that 30 sec- 1 min as the duration of irrigation, 6.5% of the participants were aware that 1-2 min as the duration of irrigation. A similar study was conducted by Miglani in which 25% of the participants were aware that 30- 1 min as the duration of irrigation, 55.6% of the participants were aware that 1-2 min as the duration of irrigation, 19.4% of the participants were aware that > 2min as the duration of irrigation [36].

In the present study, 87% of the participants were aware when to remove the smear layer. A similar study conducted by Garberoglio in which 50% of the respondents remove the smear layer [37]. A similar study was performed by Al-Ali in which 68.7% of the participants remove the smear layer [31]. A similar study was performed by Shrestha in which 80.7% of the respondents remove the smear layer [34].

In the present study, 84.5% of the participants were aware of irrigant which differ based on the pulpal or peri apical diagnosis. In contrast, the study conducted by Torabinejad in which 84% of the participants were aware of irrigant which differs based on the pulpal or peri apical diagnosis [38].

In the present study, 67% of the participants used ultrasonic activation as the adjuncts to irrigation, 14.5% of the participants used sonic activation, 11.5% of the participants used manual agitation and 7% of the participants used LASER. In contrast, a study performed by Shrestha in which 10.1% of the respondents used ultrasonic activation as the adjuncts to irrigation [34].

Conclusion

Dental practitioners had overall good knowledge and awareness on the irrigant activation devices. On comparing different education levels, Endodontists had good knowledge and awareness regarding the irrigant activation devices. It is recommended that dental practitioners and specialists should be more exposed and motivated about the principles of endodontics during their dental education in order to be prepared for future practice of utilizing irrigant activation devices.

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