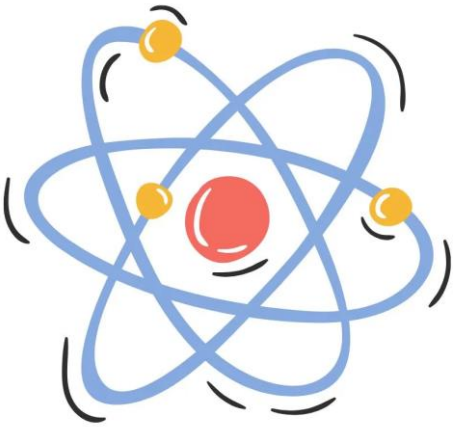

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RINSING RIGHT: A SURVEY ON ENDODONTIC IRRIGATION PRACTICES

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ABSTRACT - *Aim: The present survey aimed to analyse the choice of irrigant used and irrigant activation technique employed among dental practioners. Methodology: A self-structured questionnaire was distributed electronically via Google Forms. The questionnaire comprised multiple-choice questions supplemented with areas for additional comments. Key aspects explored include the selection of irrigants, volume delivered per canal, utilization of adjuncts, and the irrigation protocol adopted. A diverse pool of dental practitioners participated, offering insights into current trends and preferences in endodontic irrigation. Results: The survey revealed that postgraduate students comprised the largest proportion of respondents, followed by general practitioners and endodontists, with undergraduate students being the least represented. Chlorhexidine was preferred for non-vital teeth and retreatment cases, while sonic/ultrasonic activation was the most favoured method. Most respondents supported awareness programs on irrigation significance. In conclusion, as endodontics progresses into an era of technological advancements and evidence-based practices, this survey endeavours to navigate the currents of contemporary irrigation techniques, providing a comprehensive view of the strategies employed by dental professionals worldwide.*

KEYWORDS: Irrigant, Irrigant Activation, Irrigation Protocol

INTRODUCTION

The root canal system is highly complex with extra canals, lateral canals, communications and multiple portal of exits which poses a challenge for the success of the endodontic treatment.[1] The success of endodontic treatment depends primarily on eradication of microorganisms from the root canal system and preventing their reinfection. This can be achieved by chemo-mechanical debridement of the root canal system.[2]

It has been found that a considerable percentage (35%) of root canal surfaces were left untouched, regardless of the instrumentation technique used. In addition to this, an irrigant that is liquid in nature can reach beyond the confines of an instrument to these untouched surfaces. Thus, irrigation plays a pivotal role in the debridement of root canals as it allows for cleaning beyond what might be achieved by root canal instrumentation alone.[2]

The ideal characteristics of root canal irrigants as described by Zehnder includes being systemically non-toxic, non-irritant and biocompatible with the oral hard and soft tissues, inactivate endotoxin, be little potential to cause an anaphylactic reaction, capable of possessing antimicrobial and tissue dissolution properties and removal of smear layer.[3,4]

Various irrigating solutions are available in the market, Sodium Hypochlorite (NaOCl) being the most commonly employed one at the concentration of 5.25%. Another irrigant available is 2% Chlorhexidine which is effective against E. Faecalis.[5] Apart from the irrigating solutions available, various adjuncts are also being used to enhance their efficiency such as manual dynamic activation, sonic and ultrasonic activation, photon induced disinfection and many more.[6]
The aim of this survey study was to obtain and compare data regarding the choice of irrigating solution and the activation technique preferred among dental practitioners.

MATERIAL AND METHODS

A self-structured questionnaire form was prepared using Google Forms. It was electronically circulated among dental practitioners. The questions were structured as multiple choice questions along with space for additional comment.
The survey form focused on aspects such as choice of irrigant, volume delivered, use of adjuncts and the protocol undertaken.
A total of 200 responses were received. The data was collected and transferred to Microsoft Excel. The data was then statistically analysed using SPSS software.

RESULTS:

Out of the total respondents, the major proportion comprised of postgraduate students follwed by general practitioners and endodontists and the least contributors were undergrauate students.(Figure 1)

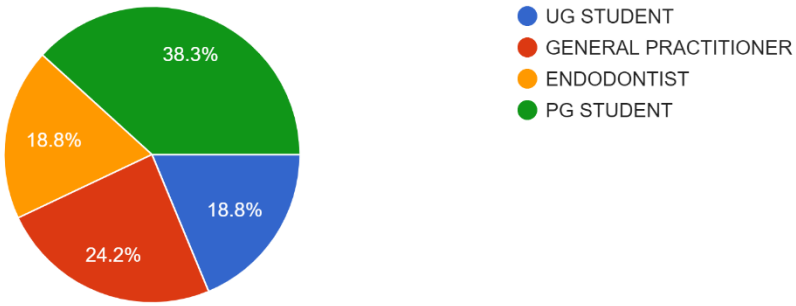

Figure 1: Qualification of Respondents

The average clinical experience of the respondents ranged from 0-5years.(Figure 2)

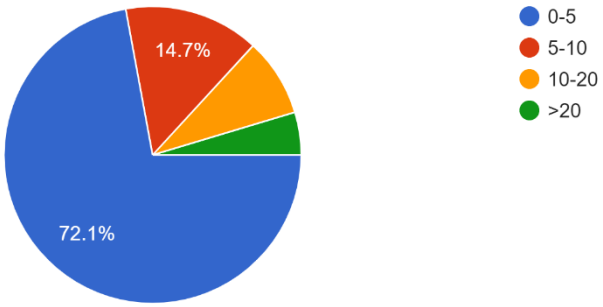

Figure 2: Years of Experience

33.7% of the respondents were found to use Sodium Hypochlorite (NaOCl) as the choice of the irrigant followed by the use of normal saline and chlorhexidine. (Figure 3)

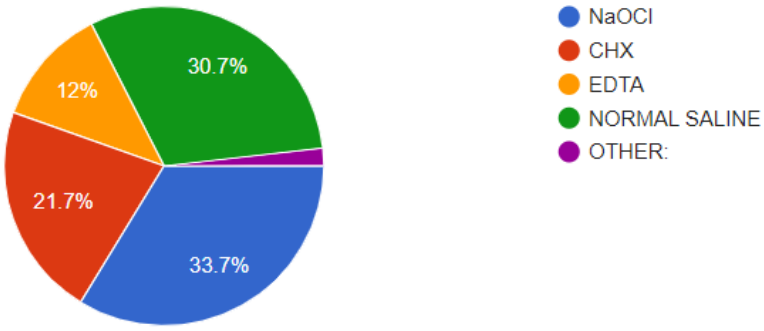

Figure 3: Choice Of Irrigant

However, majority of the respondents preferred chlorhexidine as the choice of irrigant for a non vital tooth or a case of retreatment. (Figure 4,5).

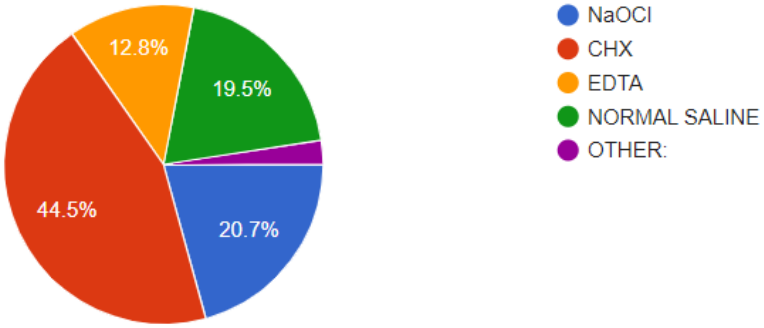

Figure 4- Choice Of Irrigant For A Non Vital Tooth

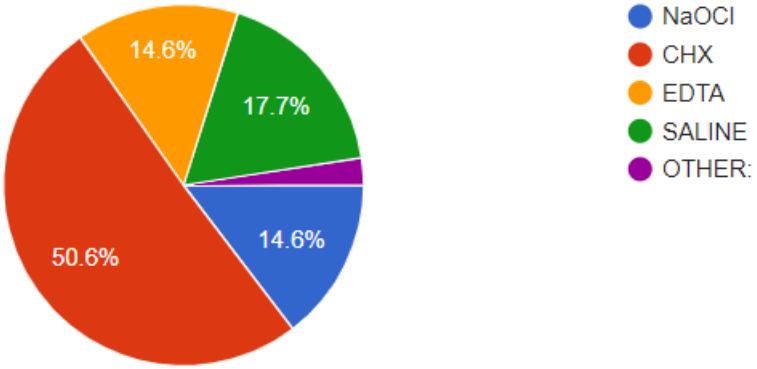

Figure 5- Choice Of Irrigant For A Retreatment Case

The choice for delivery of the irrigating solution was the use of a side vent needle(54.6%) and the volume delivered per canal was 10-20ml.(Figure 6,7)

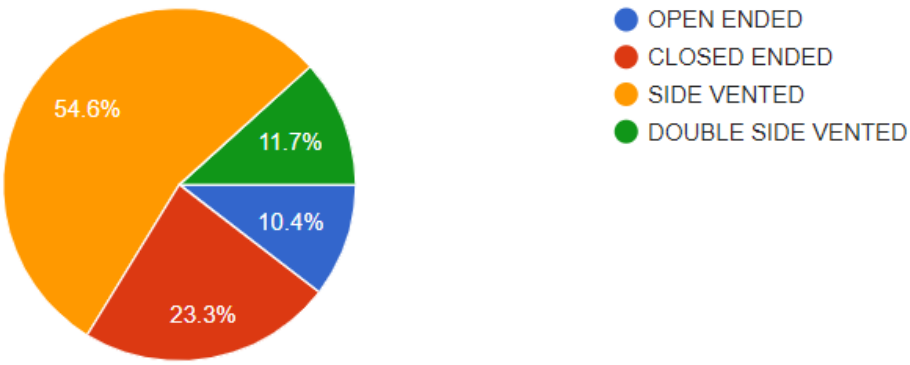

Figure 6- Type Of Needle Used For Delivery Of Irrigant

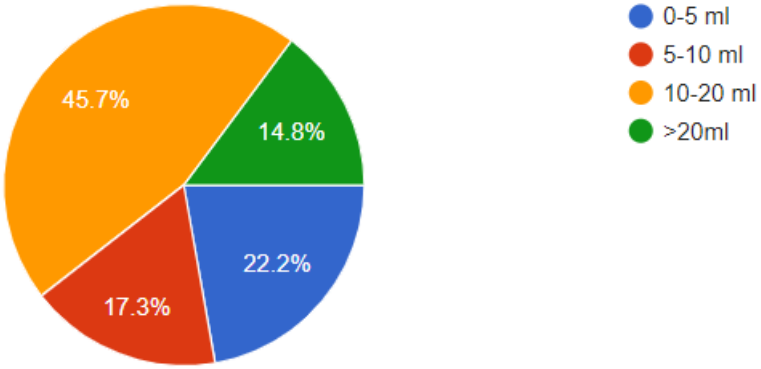

Figure 7- Volume Of Irrigant Delivered Per Canal

Of the total respondents, about 61% of them believed in activation of the irrigant solution while 19% of them believed it to be time consuming and hence did not activate the irrigant.(Figure 8,9,10)

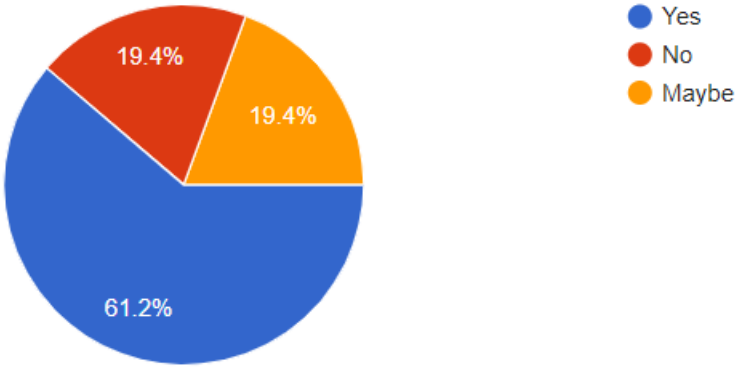

Figure 8- Belief In Activation Of Irrigant

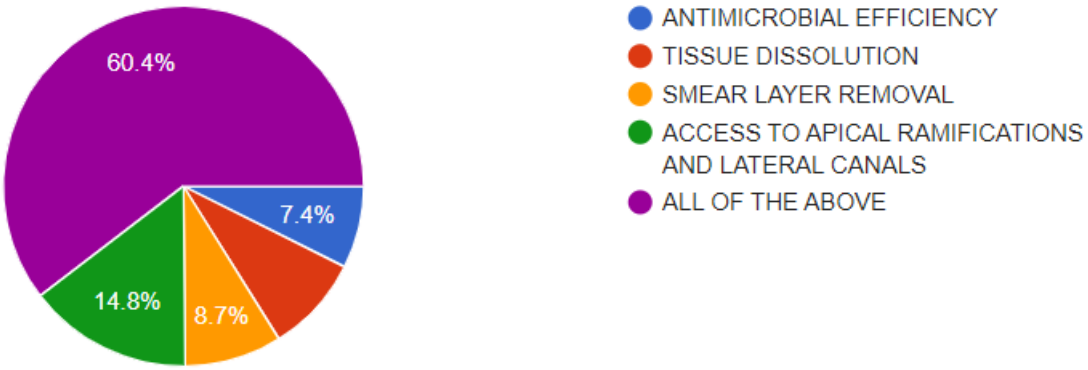

Figure 9- Reason For Activation of Irrigant

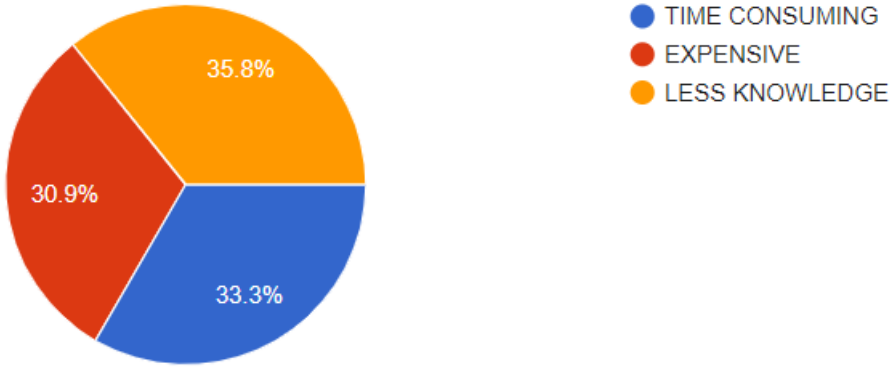

Figure 10- Reason For Not Activating Irrigant

The most preferred activation method employed was the use of sonic/ultrasonic activation (53.6%) (Figure 11)

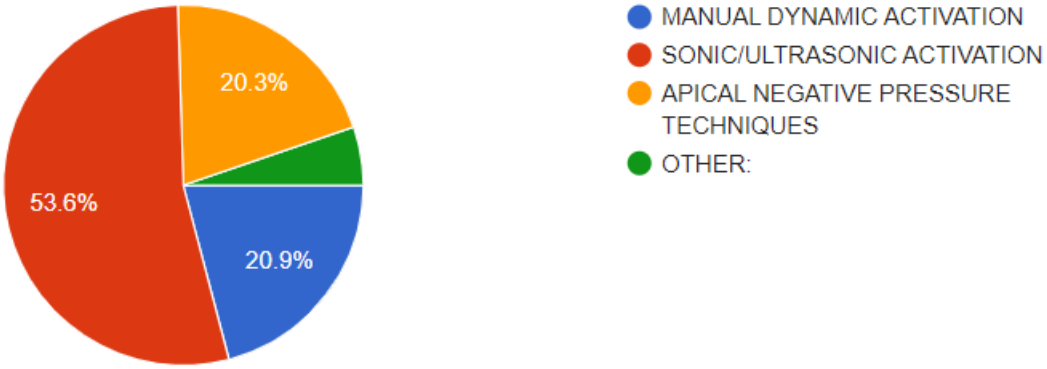

Figure 11- Preferred Method Of Activation Of Irrigant

The practitioners employed activation after cleaning and shaping of root canal (55.9%) while some used activation after every instrumentation (25.7%). However, some believed that activation should be performed both during and after shaping of the root canal. (Figure 12)

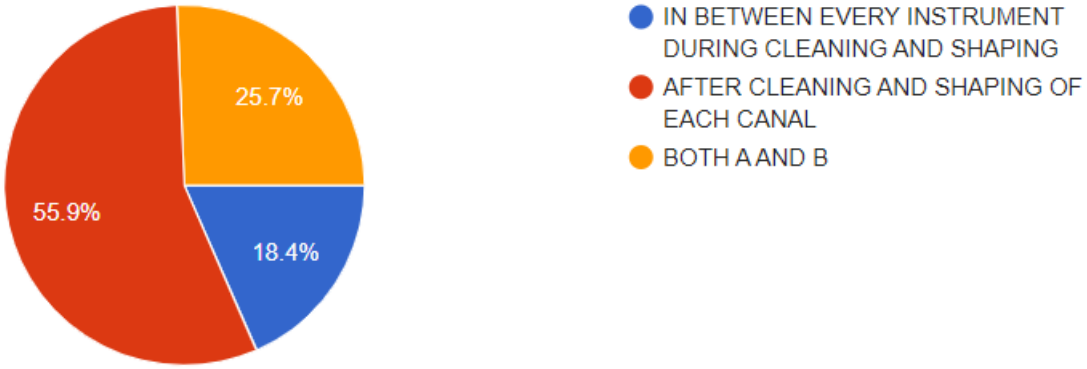

Figure 12- When To Activate The Irrigant

The most preferred irrigation protocol was use of NaOCl in between instrumentation followed by flush of saline and then CHX and EDTA as final rinse(44.9%) (Figure 13)

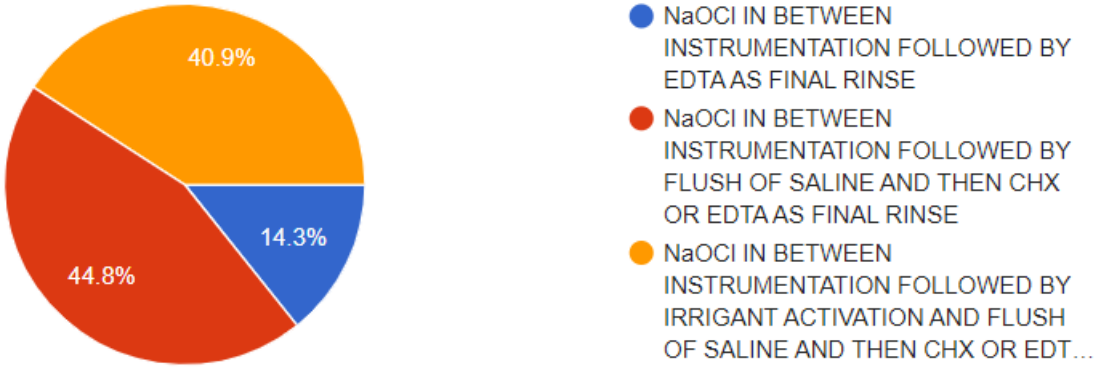

Figure 13- Irrigation Protocol Preferred

About 81% of the respondents believed that awareness programs should be carried out to increase knowledge about the significance of irrigation of root canals.(Figure 14)

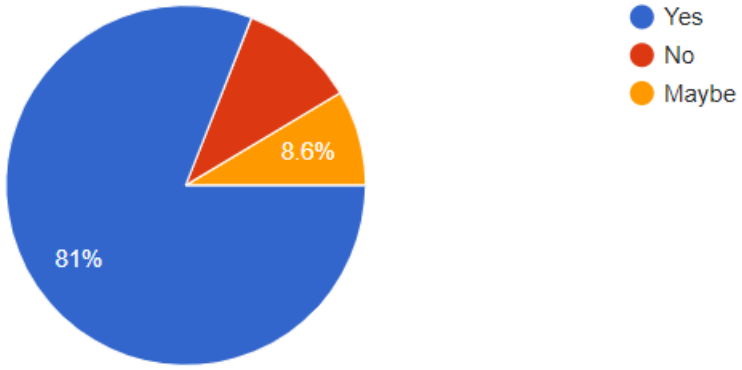

Figure 14- Need For Awareness of Significance Of Use Of Irrigant

DISCUSSION

In recent years, there has been a significant evolution in the techniques and materials used for root canal irrigation, aiming to enhance the effectiveness of endodontic treatment.

The majority of respondents were postgraduate students, general practitioners, and endodontists, with fewer undergraduate students participating. This distribution reflects a diverse pool of dental professionals, which is crucial for understanding varied perspectives and practices in root canal treatment.[3]

The present study demonstrated the use of NaOCl as irrigant of choice and chlorhexidine was favored for non-vital teeth and retreatment cases. This was in accordance to Iandolo et al 2023 who discussed the use of various irrigants for clinical situations along with irrigant activation.[7] The probable reason as per the literature for the popularity of NaOCl may be attributed to its high tissue dissolving capacity.[8,9] Preety, R. and Antony, S. D. P conducted a KAP survey on endodontic irrigants and their deleterious effects, shedding light on the factors influencing irrigant selection and usage patterns among dental professionals. The preferences observed in our study resonate with their findings, suggesting a growing recognition of the importance of selecting irrigants based on their antimicrobial properties and potential adverse effects.[10]

The most traditional method of activating the irrigant is needle syringe activation.

Application of an irrigant into a canal by means of a syringe and needle allows placement, replenishing of existing fluid, rinsing out of larger debris particles, as well as allowing direct contact to microorganisms in areas close to the needle tip.[11] However, Dioguardi M et al in their study demonstrated that it faces a series of problems just as the vapor lock effect and a lower degree of disinfection.[12]

A considerable percentage of respondents believed in activating the irrigant solution, with sonic/ultrasonic activation being the most preferred method. The results were in accordance with the studies conducted by Gyulbenkiyan E (2023), Tonini et al (2022) and Tashkandi N(2022) wherein they have discussed the use of sonic and ultrasonic activation methods for increasing the irrigant efficacy.[13,14,15]

Susila A, Minu J. (2019) conducted a systematic review comparing activated irrigation with conventional non-activated irrigation in endodontics. Their findings highlighted the potential benefits of activated irrigation in improving debris and smear layer removal. The preference for sonic/ultrasonic activation observed in our study aligns with their conclusions, indicating a growing recognition of the efficacy of activation methods in enhancing irrigation outcomes.[16]

The preferred irrigation protocol involved using NaOCl between instrumentation along with activation, followed by saline flush, chlorhexidine, and EDTA as a final rinse Li Q et al (2020) also conducted a study wherein four different irrigation protocols were evaluated. The findings of the study indicated the use of passive ultrasonic activation of the irrigant effective for smear layer removal.[17]

Sharkov N et al in their study reported that most of the practitioners in their continuing education covered mainly general dentistry – 52%, while about 1.2 % had covered endodontics in particular. [18]Jain A. et al discussed recent advances in irrigation systems, emphasizing the importance of incorporating technological innovations into clinical practice.[19] Topbas C et al emphasized the role of education in promoting evidence-based practices in endodontics.[20] Our results were also in accordance with the literature for creating awareness among the practitioners for judicious use of irrigants and the adjuncts for effective debridement.

CONCLUSION

The findings from these survey studies underscore the importance of continuous education, evidence-based practice, and technological innovation in shaping current trends and practices in root canal irrigation. Addressing knowledge gaps, promoting standardized protocols, and embracing technological advancements are essential steps towards enhancing the effectiveness of endodontic treatment and improving patient outcomes.

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