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IRRIGATION PROTOCOL USED BY ENDODONTISTS, PAEDODONTISTS AND POST-GRADUATE STUDENTS DURING PULPECTOMY PROCEDURES-A PILOT SURVEY

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Abstract:

Aim: The purpose of the study was to determine the root canal irrigation trends being practiced amongst endodontists, paedodontists, and post-graduate students in Chennai.

Background: The success of endodontic treatment depends primarily on the eradication of micro-organisms from the root-canal system and prevention of re-infection. The presence of necrotic or vital tissue remnants within the root canal space may provide a source of nutrition for the surviving bacteria. As on date, in spite of its unpleasant taste, toxicity, and inability to completely remove the smear layer, NaOCl remains the recommended irrigant. The advantage of chlorhexidine (CHX) is its substantivity. Adjuncts to irrigation such as sonic, ultrasonic, and subsonic activation improve the delivery and efficacy of irrigants to the apical third in order to improve the canal cleanliness.

Methodology: In this study a survey was conducted amongst 500 practising dentists, who included endodontists, paedodontists, general practitioners and post graduate students. The data were collected and recorded in a Microsoft excel spreadsheet and statistics was done.

Keywords: Irrigation, Sodium hypochlorite, Pulpectomy, Protocol.

Introduction:

The aim of endodontic treatment is chemo-mechanical removal of infected pulp tissue and dentine, as well as potent microbes from inside the canal system of the tooth and to prevent re-infection. The success of endodontic treatment demands careful attention in case selection, which should be followed by meticulous management of canal preparation, sterilization, and obturation.^[1] Root canal instrumentation produces a layer of organic and inorganic material called the “smear layer” that contains bacteria and their by-products that prevents penetration of intracanal medicaments into dentinal tubules and the adaptation of filling materials to canal walls. The question of keeping or removing the smear

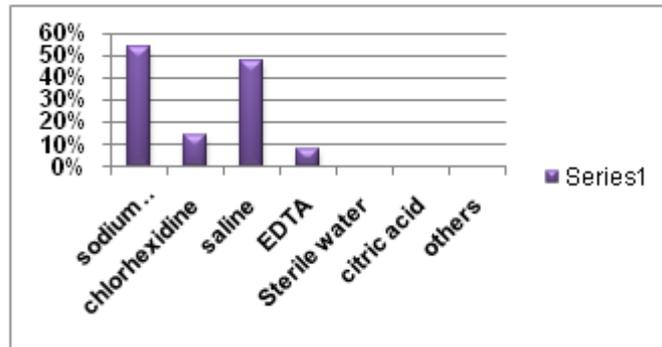
layer remains controversial (Drake et al. 1994, Shahravan et al. 2007); yet relevant data suggests that smear layer removal should enhance canal disinfection. Current methods of smear layer removal include (1) Chemical, (2) Ultrasonic and (3) Laser techniques neither of which though, are 100% effective in either throughout the length of all canals or are universally accepted. Vast research data shows the limited ability of instrumentation alone in effective near-complete removal of bacteria and debris from the canal [2-6] and that no instrumentation technique comes close to complete sterilization of the root canal system, and that the remaining approximately 40% of the canal surface is debrided and disinfected only with irrigation with or without adjuvant techniques. Chemo-biomechanical cleaning and shaping of the root canal greatly reduces the number of bacteria, although extensive studies have shown that bacteria still persist.^[7,8] Therefore, irrigation, defined as “to wash out a body cavity with water or a medicated fluid, or with strong antibacterial agents is imperative to complete the cleaning and shaping process. It is thus imperative to understand the two main objectives of irrigation, being - Mechanical & Biological. The mechanical objective achieves the following: (1) flushing out debris, (2) lubricating the canal, (3) dissolving organic and inorganic tissue and (4) bleaching. The biological function of the irrigants is primarily related to their antimicrobial effect.^[9] Currently there is no single irrigant that meets all the requirements for an optimal irrigating solution.^[10] A combination of products and in the correct irrigation sequence complimented with effective and efficient adjuvant technique contributes to the most successful treatment outcome. Hence, our survey was to assess the use of root canal irrigant amongst pediatric dentists.

Materials and Methods:

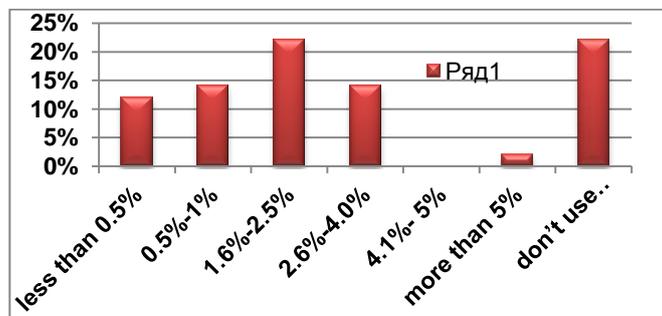
In this study a survey was conducted amongst 500 practising dentists, who included endodontists, pedodontists , general practitioners and post graduate students, in Chennai, Tamil nadu. Survey participants were asked about their irrigant selection, irrigant concentration, smear layer removal, and use of adjuncts to irrigation. Questions consisted of multiple choices, and multiple selections with options for write-in answers where appropriate. The data were collected and recorded in a Microsoft xcel spreadsheet and statistics was done.

Result: The data of the current survey indicate that (58%) of the participants prefer sodium hypochlorite and primary irrigant, followed by (48%) saline, (14%) chlorhexidine and finally (8%) EDTA (graph 1). Most respondents (22%)use 1.6%-2.5% strength of sodium hypochlorite(graph 2). 16% of the respondents used 0.18%-1.9% of strength chlorhexidine (graph 3). 48% of the participants preferred to use 2.5ml irrigant in each canal (graph 4). Sodium hypochloride (58%) is the preferred irrigant by most respondents to treat a tooth with a vital pulp and chlorhexidine (60%) was preferred while treating a tooth with periapical lesion. when asked about the adjuncts used it was

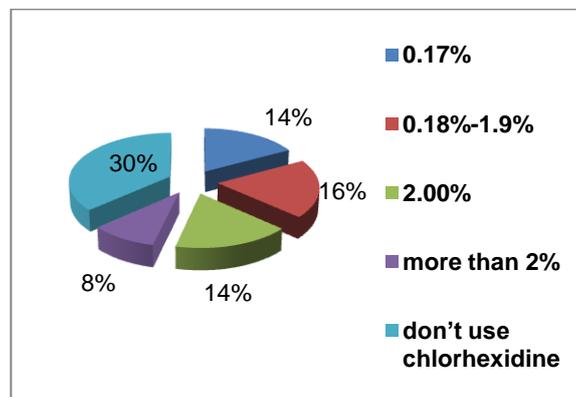
identified that (40%) use ultrasonic activation as an adjuvant (GRAPH 7). It was also found that (53%) of the respondents used 26 gauge needle during mechanical activation. 80% of the practitioners aim the remove the smear layer during pulpectomy procedures and (32%) used sodium hypochlorite as final irrigant in tooth with vital pulp (GRAPH 5) and (42%) used chlorhexidine as final irrigant in tooth with non- vital pulp (GRAPH 6), indicating change in irrigant preference according to the status of the pulp.



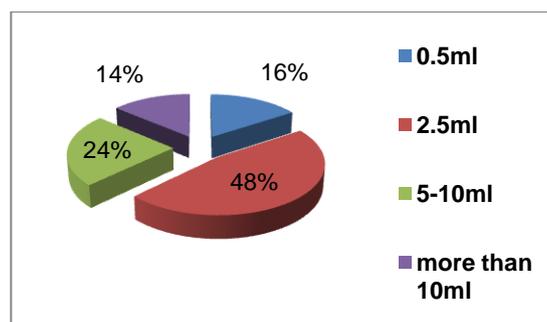
Graph 1: Preferred primary irrigant



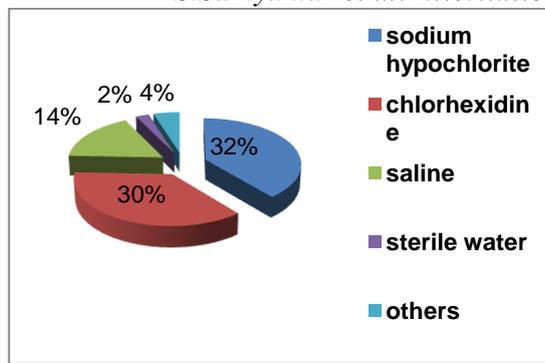
Graph 2: Preferred concentration of sodium hypochlorite



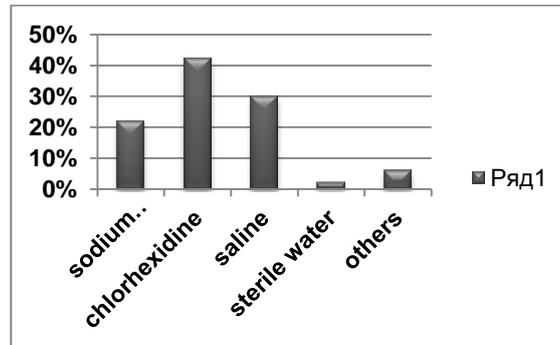
Graph 3: Preferred concentration of chlorhexidine



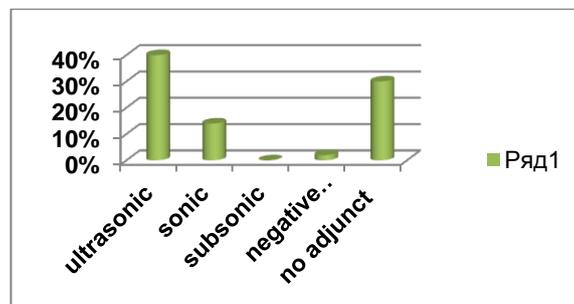
Graph 4: Preferred volume of primary irrigant



Graph 5: Choice of final irrigant- vital pulp



Graph 6: Choice of final irrigant - non- vital pulp



Graph 7: Choice of adjunct

Discussion:

This survey was conducted amongst endodontists, paedodontists, general practitioners and post graduate students in Chennai, Tamil Nadu. 500 survey sheets were printed and distributed. This study was conducted to understand the level of knowledge about irrigation protocols in paedodontic patients during pulpectomy procedures amongst practitioners.

In this study, it was found that the majority of the respondents (54%) use sodium hypochlorite as their primary irrigant, with most of them (22%) using a concentration of 1.6%-2.5%. The high tissue dissolving property and antibacterial effects of sodium hypochlorite attribute to its high popularity amongst the practitioners. The results were comparable to the survey conducted in Australia which reported that 94% of endodontists used sodium hypochlorite, though the concentration of irrigant used varied.^[11] The use of chlorhexidine as a primary irrigant was found to be low (14%) amongst the practitioners. This was similar to the survey conducted in Himachal Pradesh.^[12]

80% of the respondents who participated in the survey aimed to remove the smear layer. The finding was similar to other studies in which more than 50% dentists were methodically removing the smear layer before obturation.^[13]

However the result was in contrast with that obtained in a study conducted in Himachal Pradesh.^[12]

A major percentage (74%) of the respondents in the study stated that their choice of irrigant depends on the status of the pulp and the periapical tissues. 42% of the practitioners preferred to use chlorhexidine for teeth with non-vital pulp. this could be due to the good substantivity of the irrigant. This was in accordance with the study conducted in Australia.^[11] Though did not correspond to the results obtained in himchal pradesh.^[12]

When asked about the adjuncts used for irrigation, it was found that 40% of the respondents used ultrasonic activation and subsonic activation was no being used at all. These results were in contrast to those obtained in Himachal Pradesh.^[12]

The results on all the aspects of irrigant usage amongst the practitioners in the current study indicate a fair knowledge about the irrigation protocols amongst the practising dental professionals in Chennai.

Conclusion:

The findings of the current survey are that the majority of practising dentists in Chennai and post-graduate students in Saveetha Dental College & Hospitals, Chennai (54%) are employing NaOCl (1.6-2.5%) as the primary endodontic irrigant, with 26 gauge needle being most preferred for syringe irrigation. 2.5 ml is the most commonly used volume of irrigant. Sodium hypochlorite was the most preferred final irrigant in case of vital pulp and Chlorhexidine the most preferred final irrigant in the case of non-vital pulp. Hence it can be concluded that the choice of irrigant varied according to the vitality status of the pulp tissue. In addition, 40% of the respondents are using ultrasonic activation as an adjunct, as an aid to their irrigation technique.

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