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ANALYSIS OF MOST COMMON IRRIGANT AND MOST COMMON METHOD OF IRRIGANT USAGE BY DENTISTS IN PAKISTAN

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Abstract:

Introduction: *Irrigation is an essential part of root canal debridement. It allows for cleaning beyond what might be achieved by root canal instrumentation alone. It helps by killing microorganisms, flushing debris, and removing the smear layer from the root canal system.* ***Aims and objectives:*** *The main objective of the study is to analyze the most common irrigant and most common method of irrigant usage by dentists in Pakistan.* ***Material and methods:*** *This survey analysis was conducted in THQ Hospital, Fort Abbas during March 2018 to October 2018. The data was collected from 100 dental doctors for finding the most common irrigant method used in different hospitals of Pakistan. Survey participants were asked about their irrigant selection, irrigant concentration, smear layer removal, and use of adjuncts to irrigation. Questions consisted of numeric rankings, multiple choices, and multiple selections with options for write-in answers where appropriate. The apical portion of each canal was enlarged to F1 size to allow adequate cleaning and penetration of the solution to the apical third of each root canal.* ***Results:*** *The data was collected from 100 dental doctors of both males and females. The respondents of our survey, comprised of 47% being post-graduate students, 26.4% were teaching faculty with less than 5 years of experience, 11.8% were faculty with 5-10 years of experience, 9.3% were faculty with 11-20 years of experience, 3.8% were faculty with 21-30 years of experience and 1.6% respondents were faculty with a clinical experience of more than 30 years. Among all experience groups, our data indicate that 92.8% of respondents are employing NaOCl as their primary irrigant.* ***Conclusion:*** *It is concluded that NaOCl was found out to be the most common irrigant used and the most common method of irrigation.*

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INTRODUCTION:

Irrigation is an essential part of root canal debridement. It allows for cleaning beyond what might be achieved by root canal instrumentation alone. It helps by killing microorganisms, flushing debris, and removing the smear layer from the root canal system. Smear layer prevents the penetration of intracanal medicaments into dentinal tubules and influences the adaptation of filling materials to canal walls [1]. It consists of organic and inorganic substances, including fragments of odontoblastic processes, microorganisms, their by-products, and necrotic materials. The alternate use of sodium hypochlorite (NaOCl), a deproteinizing agent, and ethylenediaminetetraacetic acid (EDTA), a calcium-chelating agent, has been recommended for its efficient removal [2].

These irrigants must be brought into direct contact with the entire canal wall for effective action. During conventional needle irrigation, replenishment, and fluid exchange do not extend much beyond the tip of the irrigating needle. Vapor lock that results in trapped air in the apical third of root canals might also hinder the exchange of irrigants and affect the debridement efficacy of irrigants. That is why different techniques and irrigant delivery devices have been proposed to increase the flow and distribution of irrigating solutions within the root canal system [3].

The success of endodontic treatment depends primarily on the eradication of micro-organisms from the root-canal system and prevention of their reinfection. The root canal system is shaped with the help of stainless steel and nickel-titanium instruments. This shaping process is accomplished in conjunction with constant irrigation to remove the inflamed and necrotic tissue, microbes/biofilms, and other debris from the root-canal space. Despite the advent of numerous modern techniques and instruments in canal shaping, more than 35% of the root canal's surface can be left un-instrumented after non-surgical root canal treatment [4].

The presence of necrotic or vital tissue remnants within the root canal space may provide a source of nutrition for the surviving bacteria. Thus, microorganisms, either remaining in the root canal space after treatment or those re-colonizing the filled canal system, are the main etiological causes of endodontic failures. The role of the irrigation protocol thereby plays a key role in the disinfection of the root canal space [5].

Aims and objectives

The main objective of the study is to analyze the most common irrigant and most common method of irrigant usage by dentists in Pakistan.

MATERIAL AND METHODS:

This survey analysis was conducted in THQ Hospital, Fort Abbas during March 2018 to October 2018. The data was collected from 100 dental doctors for finding the most common irrigant method used in different hospitals of Pakistan. Survey participants were asked about their irrigant selection, irrigant concentration, smear layer removal, and use of adjuncts to irrigation. Questions consisted of numeric rankings, multiple choices, and multiple selections with options for write-in answers where appropriate. The apical portion of each canal was enlarged to F1 size to allow adequate cleaning and penetration of the solution to the apical third of each root canal. 3% NaOCl was used as an intra-canal irrigant in between each file size for the experimental samples. After instrumentation was complete the final irrigation of the samples was done with 17% EDTA (1 ml) and 3% NaOCl (3 ml), followed by normal saline (3 ml).

Statistical analysis

The data was analyzed on SPSS version 17. Chi-square test and cross tabs were applied to determine the relationship.

RESULTS:

The data was collected from 100 dental doctors of both males and females. The respondents of our survey, comprised of 47% being post-graduate students, 26.4% were teaching faculty with less than 5 years of experience, 11.8% were faculty with 5-10 years of experience, 9.3% were faculty with 11-20 years of experience, 3.8% were faculty with 21-30 years of experience and 1.6% respondents were faculty with a clinical experience of more than 30 years. Among all experience groups, our data indicate that 92.8% of respondents are employing NaOCl as their primary irrigant.

Table 01: Percentage of respondents who utilize each irrigant as their primary irrigant

Irrigation Solutions	Frequency (n)	%	Intracanal Medicament	Frequency (n)	%
Sodium hypochlorite	546	73	Calcium hydroxide	398	53,2
EDTA or other chelating agents	242	32,4	Chlorhexidine	276	36,9
Distilled water or saline	218	29,1	Antibiotics	116	15,5
Sodium hypochlorite + H_2O_2	190	25,4	Eugenol	88	11,8
H_2O_2	180	24,1	Formocresol	64	8,6
Acohol	8	1,1	Cresatin	50	6,7
			Corticosteroids	32	4,3
			Missing	6	0,8

Table 02: Comparison of surveys conducted on irrigation protocol

Sealers	Frequency	%	Obturation Techniques	Frequency	%
Zinc oxide eugenol based	42	5,7	Sealer alone	134	18,1
Calcium hydroxide based	260	35,1	Silver cone	4	0,5
Paraformaldehyde based	312	42,2	Single cone	192	25,9
Polymers	358	48,4	Lateral condensation	490	66,2
Glass ionomer based	8	1,1	Vertical condensation	60	8,1
Iodoform	30	4,1	Warm gutta percha	128	17,2
Others			Other		
Missing	8	1,1	Missing	8	1,1

DISCUSSION:

Calcium hydroxide was the most commonly used medicament (53% of respondents). The remaining practitioners used different formulations, including chlorhexidine, fenolic compounds, aldehydes, eugenol, formocresol, peroxides, antibiotics, and corticosteroids. In this study, sodium hypochlorite was the most popular root canal irrigant [6]. Aqueous sodium hypochlorite solution (0.5–5.25%) is the current gold standard irrigant solution, combining profound antimicrobial and soft-tissue solvent activity. Sodium hypochlorite combined with hydrogen peroxide and chlorhexidine has been described in the literature [7]. Furthermore, the use of irrigants such as chloramine and saline are not recommended for endodontic use, as they do not have the antimicrobial and tissue-solving capacities of a sodium hypochlorite solution. In this study, 29.1% of the respondents used distilled water or saline. Hommez et al and Al-Omari stated that a possible reason for not using sodium hypochlorite instead of a weak solution was the limited use of rubber dam [8]. Calcium hydroxide is recommended as the standard intracanal dressing in root-canal treatment. In the present study, calcium hydroxide was used by 53% of the respondents and, it was mainly employed by younger practitioners [9], which is considerably more than the 21.1% in the study by Saunders et al, the 7% in the study by Jenkins et al[6] in the UK, the 6.8% in the study by Ahmed et al in Sudan, the 11.5% in the study by Al-Omari, or the 9% in the USA. However, in Dutch and Flemish studies, the percentage of respondents using calcium hydroxide was 86.2% and 64.6%, respectively [10].

CONCLUSION:

It is concluded that NaOCl was found out to be the most common irrigant used and the most common method of irrigation. The concept of smear layer removal is high, and there is a general trend to modify the irrigant protocol according to the status of the pulp, status of the periapex and in retreatment cases.

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