

Cross-Sectional Study on Irrigation Practices in Endodontic Procedures among Dental Practitioners in an Urban Area of Andhra Pradesh

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Abstract

Background: Thorough irrigation of the root canal is necessary to disinfect microorganisms, removing smear layer portions (both organic and inorganic) of the root canal system and to flush out debris. there is no single ideal irrigation solution till date which can perform all the desired functions. **Objectives:** To study the pattern of irrigation practices during endodontic procedures among dental practitioners in Kurnool urban area, Andhra Pradesh. **Materials and Methods:** A hospital based cross sectional study was conducted for a period of six months from June 2016 to December 2016. 168 dental clinics consulted to participate in the study. **Results:** All the 168 practitioners were using saline as primary irrigant. Other irrigants used along with saline were NaOCl 78.6%, EDTA 56%, and Chlorhexidine 28.76%. Only 7.1% were using sterile water along with saline as irrigating solution. The response to primary irrigant used majority 48.2% (81) were using saline followed by 46.4% (78) sodium hypochlorite. 52.9% (89) of the respondents were using sodium hypochlorite in the concentration of 2.6% to 4%. Similar proportion using chlorhexidine in the concentration of 2%. **Conclusion:** This study concludes that most of the practitioners were using normal saline as primary irrigant and 26 gauge needle was the most preferred for irrigation. It clearly depicts that there is a need for updating of the knowledge among practitioners with regard to selection of primary irrigants so that the quality of endodontic care can be improved.

Keywords: Canal Irrigation; Dental; Smear Layer; Sodium Hypochlorite.

Introduction

The most critical step in eradication of microorganism from the root canal system as part of endodontic treatment is adhering to strict irrigation protocols. This also helps in preventing the reinfection [1]. Biomechanical preparation

techniques using nickel titanium files have the chances of leaving 35% of the root canals surface uninstrumented [2].

Hence thorough irrigation of the root canal is necessary to disinfect microorganisms, removing smear layer portions (both organic and inorganic) of the root canal system and to flush out debris. Using this method the above mentioned issues can be addressed [3]. It can be stated that there is no single ideal irrigation solution till date which can perform all the desired functions.

Some have properties of dissolving the tissue in the root canal and some have antimicrobial activity in addition to cytotoxic in nature [4]. Sodium hypochlorite (NaOCl) in the concentration of 0.5 to 0.6% is the most commonly used irrigating the root canal because of its bactericidal activity and dissolving the necrotized tissue. But it lacks the property of acting on inorganic components of smear layer [5, 6].

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Received on: 15.05.2018, **Accepted on** 09.06.2018

Other agents like ethylene diaminetetraacetic acid (EDTA) and phosphoric acid citric acid are recommended as irrigation solutions [7]. Many studies have reported about the different irrigants and treatment protocols however there is sparse data about practice of such methods by General Dental Practitioners (GDPs).

Hence, the present study was carried to know about the pattern of irrigation practices during endodontic procedures among dental practitioners in Kurnool urban area of Andhra Pradesh.

Materials and Methods

A hospital based cross sectional study was conducted for a period of six months from June 2016 to December 2016. There are around 180 dental clinics in the Kurnool urban area. These clinics were personally visited and informed about the purpose of the study. Out of 180 clinics 168 were agreed to participate in the study and informed consent was obtained from the dental practitioners. Approval from the institutional ethics committee was obtained for conducting the study.

A Pre validated questionnaire designed by Madhusudhana Koppolu et al. [1] was used in our study (Table 1). It consisted of general information of practitioners and 20 multiple choice questions covering all the aspects of irrigation protocols followed in endodontics like the type of irrigation solutions used for various endodontic procedures, its concentration, and volume also about their perception about using that solution.

Statistical tests like percentages and proportions were applied by using Statistical Package for the Social Sciences (SPSS) version 22.

Results

Out of 168 respondents 36.3% (61) were having experience of five to ten years followed by 31.3% (51) about less than five years (Table 2).

Table 1: Distribution of practitioners according to their years of experience in endodontic therapy.

Work experience (in years)	no.(percentage)
>30	6 (3.6)
21-30	7(4.2)
11-20	29 (17.3)
5-10	61 (36.3.)
<5	53 (31.3)
Still in training	12 (7.1)

With respect to type irrigants used for the case almost all 100% (168) were using saline. The pattern of other irrigants used along with saline were NaOCl 78.6%, EDTA 56% and chlorhexidine around 28.76%. Only 7.1% were using sterile water along with saline as irrigating solution (Figure 1). When asked about the primary irrigant used majority 48.2% (81) of the subjects were using saline whereas 46.4% (78) were using sodium hypochlorite (Figure 2).

More than half i.e., 52.9% (89) of the respondents were using sodium hypochlorite in the concentration of 2.6% to 4%, rest were using Chlorhexidine in the concentration of 2%. Only 11.4% were using adjuncts to irrigation like ultrasonic activation (6.5%), laser (6.5%) and endoactivator (1.1%). The response for the use of negative pressure as an irrigation adjunct was nil. With regards to the type needle used for irrigation majority 89.8% (151) were using 26 needle gauges for syringe on other hand only 8.9% (15) were using 27 gauge needles. More than half (60.1%)

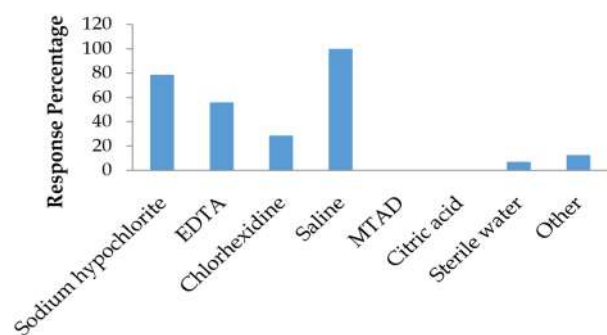


Fig. 1: Pattern of utilization of irrigants

Irrigants utilized Ethylene diaminetetraacetic acid (EDTA). Mixture of Doxycycline (MTAD), Citric acid, and Tween 80 detergent.

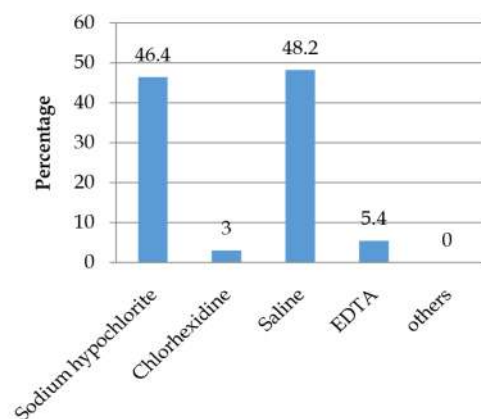


Fig. 2: Primary irrigant utilization

Percentage of respondents who utilize each irrigant as their primary or main irrigant during root canal treatment. NaOCl - sodium hypochlorite; CHX - chlorhexidine; EDTA - ethylene diaminetetraacetic acid

Table 2: Responses by practitioners on various aspects of canal irrigation (%)

Topic	Category	Result Dentist No. (%)
Irrigants utilized	Sodium hypochlorite	132 (78.6)
	EDTA	94(56)
	Chlorhexidine	48 (28.76)
	Saline	168 (100)
	MTAD	0
	Citric acid	0
	Sterile water	12 (7.1)
	Other	21 (12.5)
Primary irrigant	Sodium hypochlorite	78 (46.4)
	Chlorhexidine	5 (3)
	Saline	81(48.2)
	EDTA	9 (5.4)
	others	0
Sodium hypochlorite concentration	<0.5%	10 (5.9)
	0.5–1.5%	24(14.2)
	1.6–2.5%	10 (5.9)
	2.6–4.0%	89 (52.9)
	4.1–5.0%	0
	>5.0%	5 (3)
	I do not use NaOCl	39 (23.2)
Chlorhexidine concentration	0.2%	27 (16.1)
	0.18–1.9%	3 (1.8)
	2.0%	94 (55.9)
	>2.0%	0
	I do not use Chlorhexidine	49 (29.1)
Adjunct to irrigation	Ultrasonic activation	11 (6.5)
	Subsonic activation (Endoactivator)	2 (1.1)
	Negative pressure	0
	Laser	11 (6.5)
	No adjuncts used	149 (88.6)
Routine gauge of the needle used	26 gauge	151 (89.8)
	27 gauge	15 (8.9)
	30 gauge	5(3)
	31 gauge	0
Volume of syringe preferred	1 mL	0
	2.5 mL	48 (28.5)
	5 mL	101 (60.1)
	10 mL	23 (13.6)
Volume of irrigant used per canal	0.5 mL	0
	2.5 mL	43 (25.6)
	5–10 mL	94 (55.9)
	>10 mL	34 (20.2)
Duration of irrigation	<30 seconds	39 (23.2)
	30 seconds–1 minute	112 (66.7)
	1–2 minutes	22 (13.1)
	>2 minutes	0

MTAD: Mixture of doxycycline, citric acid , EDTA: Ethylene diaminetetraacetic acid; and Tween 80 detergent

of the practitioners were using the 5 ml syringe for about 30 seconds to 1 minute per canal.

Discussion

Our study attempted to collect the data from dental practitioners in Kurnool urban area of Andhra Pradesh. In our survey it was reported that 46.4.2% were using normal saline as primary irrigant and this finding was similar to study done by Hussain et al. [8] in Pakistan where it was around 56.7% whereas studies done by Slaus et al. [9] (2002), Clarkson et al. [10] (2003), Gopikrishna et al. [11] (2013), Dutner et al. [12] (2012) and Damanpreet et al. [13] (2014) and other similar studies [14,15] reported NaOCl as the choice for primary irrigant ranging from 38% to 94%.

Study by Whitworth et al. [16] (2000) reported the use of local anesthetic as primary irrigant (63%) whereas Tomic et al. [17] (2006) reported that hydrogen peroxide as primary irrigant solution. The reason for normal saline being used as primary irrigant in developing countries can be attributed to its low cost and easy availability

In our study only few practitioners were using Chlorhexidine as an agent of root canal irrigant which is in contrast to other studies where it has been recommended for retreatment and failures, which have increased [18,19]. The percentage of use of adjunct to irrigation was very low (11.4%) in our study while none of them were using negative pressure irrigation systems which might due to high cost factors.

Most of the respondents in our study preferred 26 gauge needle for syringe irrigation whereas study by Guerreiro-Tanomaru et al [20] (2013) in Brazil reported using 30 gauge needle for accebiltity at all stages of irrigation.

Conclusion

This study concludes that most of the practitioners were using normal saline as primary irrigant and 26 gauge needle as the most preferred one for syringe irrigation. It clearly depicts that there is a need for updating the knowledge among practitioners with regard to selection of primary irrigants thereby the quality of endodontic care can be improved.

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