# A SURVEY ABOUT THE MOST COMMON IRRIGANT AND MOST COMMON METHOD OF IRRIGANT USAGE BY DENTISTS IN RAWALPINDI/ ISLAMABAD HOSPITALS

<sup>1</sup>HINA TARIQ, <sup>2</sup>AI TARIQ MASOOD, <sup>3</sup>NOUMAN NOOR

#### ABSTRACT

The purpose of this study was to find out the most common irrigant and irrigation method used by dentists of Rawalpindi/IslamabadA questionnaire was distributed by hand to dentists in the 6 hospitals of Rawalpindi/ Islamabad which consisted of a set of 7 questions regarding the most common irrigant and the method of irrigation used for the disinfection and cleaning of the root canal system. The study was carried over a period of one week and the total number of respondents were 113. It was found out that among the 113 respondents, 70 (61.94%) were using saline as root canal irrigant, 37 (32.74%) were using NaOCL , and only 6 (5.30%), were using combination of NaOCL and EDTA. Out of 113 respondents, 101 (89.38%) were use syringe delivery method and 12 (10.61%) manually agitated the solution with file for irrigation. The most common reason for not using the NaOCL and EDTA combination was due to time constraint that didn't allow dentists to use rubber dam i.e by 75 respondents (72.82%). Unaffordability and unavailaibility was reported to be the cause by 10(9.7%) and 14(13.59%) respondants respectively. Saline was found out to be the most common irrigant used and the most common method of irrigation was found out to be through syringe delivery.

**Key Words:** *Most common irrigant, Survey* 

## INTRODUCTION

The objective of using irrigants in the root canal system is to achieve chemical disinfection which is one aspect of the chemo mechanical preparation and disinfection. The mechanical aspects of the preparation include shaping and cleaning the canal walls for delivery of irrigants while maintaining the original canal shape and retaining as much as radicular dentin as possible. The chemical disinfection include using irrigants to dissolve and remove both organic and inorganic debris, necrotic and vital tissue, bacterial byproducts.<sup>1</sup> The most popular irrigant used for this purpose is sodium hypochlorite which dissolves the organic component of the debris. Its established clinical efficacy results from its ability to dissolve necrotic tissue and organic remnants and its antimicrobial activity.<sup>2</sup> The inorganic part of the debris (smear layer) is removed using EDTA.<sup>3</sup> Sterile water or saline may be used between these two main irrigants, however, they must not be the only solutions used.<sup>4</sup> Other irrigants used are chlorhexidine (CHX) which has properties of substantivity antimicrobial activity, bio pure MTAD and tetraclan which consists of mixture

 <sup>1</sup> Corrspondenc: Dr. Rai Tariq Masood, Associate Professor Community Dentistry, Rawal Institute of Health Sciences, Islamabad, House 21-A, Street 44, Sector F-8/1 Islamabad. Cell: +92 333-57186582
E-mail address: raitariq84@hotmail.com
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Approved: June 25, 2018 of antibiotics and QMIX, consisting of CHX analog ,triclosan and EDTA.<sup>4</sup> Several methods of irrigation have been suggested to increase the efficacy of cleaning the root canal system. These include delivery of irrigants by syringe, manually activated irrigation, sonically activated irrigation, safety irrigator , laser activated etc.<sup>5</sup> The optimal chemical concentration of NaOCl is between 1% and 6%.NaOCl and EDTA irrigation not only display antibacterial and tissue dissolution effects mentioned above but also show deep penetration in areas that are impossible for mechanical instruments to reach.<sup>6,7,8</sup> 17% EDTA dissolves inorganic material and allows NaOCl to penetrate the smear layer for organic tissue dissolution and bacterial elimination<sup>9</sup>.

The objective of study was to find out if standard irrigation protocols are followed in the twin cities of Rawalpindi/Islamabad in order to make the protocols for irrigation that are being followed internationally, to be used in our hospitals for the better outcome of root canal treatment.

## METHODOLOGY

A questionnaire was distributed by hand to dentists in the 6 hospitals of Rawalpindi/ Islamabad which consisted of a set of 7 questions regarding their preferred choice of irrigant as a dentist, the ones that they are using in hospital settings, whether they work in private clinics and hospital both, the reasons for not using NaOCL and EDTA and the most common method of irrigation they are using to clean and disinfect canals in the hospital and what to their knowledge is the best method of irrigation.

The questionnaire was filled by 113 dentists which included house officers, post graduate trainees, senior registrars and assistant professors of the operative dentistry department. The study was conducted over a period of week in which I and my colleagues personally went to the following dental hospitals of Rawalpindi/ Islamabad including my hospital Rawal institute of health sciences, Islamabad. The Margalla college of dentistry Rawalpindi, armed forces of institute dentistry Rawalpindi, Islamabad medical and dental hospital Islamabad, Islamic international dental hospital Islamabad. SPSS version 21 was used to analyze the data and descriptive statistics and frequency distribution was computed. The study was approved by the institution.

## RESULTS

Of the 113 respondents surveyed, 27 (23.89 %) were working in hospital and private clinics both and 86 (76.10%) were working in hospitals only as shown in table 1.

Results are shown in the form of table and pie charts.

Table 1: Respondents by clinical setup (n=113).

TABLE 1: RESPONDENTS BY CLINICAL SETUP (N=113)

		No of respondents	%age
Gender	Female	73	64.60%
	Male	40	33.40%
Working status	Private clinic	27	23.89%
	Hospital + Private both	86	76.11%

TABLE 2: PREFERRED CHOICE OF IRRIGANT AND IRRIGATION METHOD AS CONSIDERED BY DENTISTS

Preferred choice of irrigant by dentists	No of respondents	%age		
NaOCL	83	73.45%		
Combination of NaOCL and EDTA	20	17.69%		
Saline	10	8.84%		
Preferred choice of irrigation method considerred by dentists				
By syringe delivery	67	59.29%		
Manual agitation	10	8.84%		
Safety irrigator tip	8	7.70%		



Fig 2: Reasons for not using NaOCL and EDTA



Fig 3: Dentists view about concentration of NaOCL resulting in complete disinfection of canal

Syringe delivery Manual agaitation



Fig 4: most common irrigation method used

## DISCUSSION

Sodium hypochlorite is the gold standard for irrigation in endodontic practice. The current study was to find out if this is practiced in the hospitals of twin cities Rawalpindi and Islamabad. Although the majority of the dentists have NaOCL as their irrigant of choice but in the hospitals, saline is the most common irrigant being used. According to markus hasapalo. Ya shen,. There is no single irrigating solution that alone sufficiently covers all of the functions required from an irrigant. Optimal irrigation is based on the combined use of 2 or several irrigating solutions, in a specific sequence, to predictably obtain the goals of safe and effective irrigation.<sup>10</sup>

A study was conducted by Prasanna Neelakantan et al concluded that all the experiment groups (irrigation protocols) i.e NaOCl +Etidronic acid ; NaOCl +EDTA and NaOCL +EDTA +NaOCL were significantly more effective in reducing the number of bacteria in root canals as compared to control group i.e saline.<sup>11</sup>

Another study reported that a significant reduction in the total viable count of microorganisms using saline as the irrigant and stated that this could be due to its ability to flush out debris from the root canal rather than having any antimicrobial property.<sup>12</sup> Ingle and Zeldow<sup>13</sup> Engstrom<sup>14</sup> and Baker et al<sup>15</sup> claimed that removal of bacteria and debris was a function of the quality of irrigant solution rather than its nature. They recommended the use of physiological saline; however, they failed to consider that bacteria in the root canal are alive and capable of growth and that they will continue to thrive if not eliminated from or destroyed within the root canal. Since microorganisms cannot be washed mechanically from the root canal system, they must be destroyed within it, through the use of an effective antimicrobial irrigant. Byström and Sundqvist<sup>16</sup> showed that saline irrigants significantly reduced the number of bacteria in the root canal but could not completely eliminate them, whereas Ohara et al<sup>17</sup> found saline to be completely ineffective as an antimicrobial agent.

It was found out in this study that the reason for not using NaOCL and EDTA in the hospitals setting was due to time constraints , which did not allow the dentists to use rubber dam. Rubber dam usage not only makes the use of NaOCL and other endodontic irrigants possible but its importance during the root canal therapy cannot be underemphasized. A survey investigating general practitioners in the United States showed that 60% respondents always use rubber dam, 16% usually use it, 13% sometimes use it, and 11% never use it<sup>18</sup>. This study revealed that that it may be due to increase patient load in the hospitals that dentists do not use rubber dam.<sup>19</sup>

The most common method of irrigation used by the dentists is by syringe delivery (89.38%), the second being manual agitation(10.62%). Effective irrigant delivery requires the combination of both .Needles with side vents improve the hydrodynamic activation of irrigant and reduce chances of apical extrusion and needle should remain loose in the canal to allow irrigant reflux and the debris to be displaced coronally. The mechanical

flushing action of this conventional method is relative weak. This is because of the reason that inaccessible canal extensions and irregularities are likely to harbor debris and bacteria. Factors that have been shown to improve the efficacy of syringe needle irrigation include closer proximity of the irrigation needle to the apex, larger irrigation volume and smaller-gauge irrigation needles. Smaller-gauge needles/cannulas might be chosen to achieve deeper and more efficient irrigant replacement and debridement.<sup>20</sup> Gently moving a well-fitting gutta-percha master cone or file, up and down in short 2- to 3-mm strokes (manual agitation) within an instrumented canal can produce an effective hydrodynamic effect and significantly improve the displacement and exchange of any given reagent. This push-pull motion acts by physically displacing, folding ,and cutting of fluid under "viscously-dominated flow" and frequency of this motion(3.3 Hz) is more than that of RinsEndo (1.6Hz ), creating more turbulence in the canal.21

The ultrasonic activation of root canal irrigants and of sodium hypochlorite in particular for 30s to 1 min for each canal still remains the gold standard. . It involves the use of a needle activated by ultrasound. Accumulation of debris produced by mechanical instrumentation in the inaccessible areas is preventable.<sup>22</sup>

A study conducted by Prashant jaju et al concluded that sodium hypochlorite remains to be the gold standard as an endodontic irrigant although they tried a number of new irrigant like MTAD, tetraclean, electrochemically activated solutions etc.<sup>23</sup>

A study conducted in Pakistan in 2014 by Syeda Mahwish Hussain et al also concluded that saline is the most common irrigant used by dentists despite the fact that sodium hypocholite is the standard irrigant and dentists in Pakistan fail to conform to the international standard protocol.

# CONCLUSION

According to the study, it was found out that the most common irrigant used in the hospitals was saline and syringe delivery was the most common method of irrigation used. The standard irrigant which results in complete disinfection is sodium hypochlorite in combination with EDTA which should be used with rubber dam. So the use of rubber dam should be made mandatory. Moreover if irrigant delivery with syringe is used in hospitals, it should be accompanied with manual agitation. Passive ultrasonic irrigation should be given due importance as it is nowadays considered as standard method of irrigation.

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#### **CONTRIBUTIONS BY AUTHORS**

1 Hina Tariq:	Topic selection, study conception and design, Data collection article writing.
2 Rai Tariq Masood:	Cross References and revision, Abstract, Final Review.
3 Nouman Noor:	Analysis, Interpretation of data.