ORIGINAL ARTICLE

Pain Control after Pulp Debridement in patients Receiving 5.25% Sodium Hypochlorite Irrigant

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ABSTRACT

Aim: To compare the mean pain scores after debridement of pulp in patients receiving hypochlorite and chlorhexidine as intra-canal irrigant.
Methods: This was a randomized controlled trail conducted at Department of Operative Dentistry. Total 710 patients 14-60 years of age were included in the study. The pain scores were recorded on VAS scale after debridement and irrigation of canals with 2% chlorhexidine solution versus 5.25% sodium hypochlorite.
Results: In Group-II mean pain score was significantly less as compared to that of Group-I.
Conclusion: Sodium hypochlorite (5.25%) is more effective in pain control as compared to chlorhexidine (2%) after debridement of pulp.
Keywords: 2% Chlorhexidine; 5.25% Sodium hypochlorite.

INTRODUCTION

During root canal treatment various chemical, mechanical and bacterial agents are responsible for the injury to pulp and peri-radicular tissue and this can lead topain after debridement of pulp, prevention of which is of utmost importance and challenge for the clinicians[1,2].

Careful instrumentation of root canals can prevent mechanical and chemical injuries to the peri-radicular tissue which can cause pain afterpulp debridement. However,root canal system cannot be sterilized but can be optimally disinfected by using recommended irrigants during cleaning and shaping procedures which can minimize the incidence of pain after pulp removal. Commonly used irrigants and medications are mostly cytotoxic. Severe reactions may occur and have been reported if there is extrusion to the peri-radicular tissues during cleaning and shaping[3,4].

Through the years in Endodontic practice, different irrigating solutions have been performing the sole function of elimination of micro-organisms and their substrates such as 30% Urea, Urea per Oxide in Glycerin, Chloramine, Physiological saline, Sodium hypochlorite, Hydrogen peroxide,and Ethlynediamine tetra acetic acid (EDTA)[5].
Sodium hypochlorite is popular intracanal irrigant used now a daysand shows effectiveness,and relatively low toxicity in proper concentration. An effective irrigant is essential during chemo- mechanical cleaning and shaping procedures as it helps in proper instrumentation by lubricating and rendering for the proper shaping of the root canal, hence required for 3-D obturation. The following properties of sodium hypochlorite makes it most commonly used irrigant, antimicrobial effect, tissue dissolution capacity and acceptable biological compatibility in less concentrated solutions[6-9].

One hundred percent reduction of growth of E-feacalis at 24 hours after 3% Sodium Hypochlorite irrigation was observed when compared with 2% Chlorhexidine which showed a 95% reduction in a E- Fecalis growth at24 hours[10,11]. In vitro studies comparing the antibacterial effects of 5.25% Sodium Hypochlorite with 2% Chlorhexidine showed the mean value of inhibition zones in a mixed infection to be 17 for Sodium Hypochlorite irrigation group and 11 for Chlorhexidine irrigation group[12].

A study reported the mean pain level at 24 hours in sodium hypochlorite group was 1.40 ± 0.40 and in chlorhexidine group the mean pain level was 1.30 ± 0.54 with no statistical significant difference (p-value >0.05). On the other hand another study reported the pain intensity was significantly different in chlorhexidine group as compare to sodium hypochlorite (p-value < 0.05)[13].

The objective was to compare the mean pain scores after debridement of pulp in patients receiving hypochlorite and chlorhexidine as intracanal irrigant.

MATERIAL AND METHODS

This was a randomized controlled trail conducted at Department of Operative Dentistry, LMDC, Lahore. Total 710 patients 14-60 years of age were included in the study with single rooted Maxillary and Mandibular teeth with necrotic pulps assessed by electric pulp test. In group I, 2% chlorhexidine solution and in group II, 5.25% sodium hypochlorite was used. Pain was recorded on VAS at 24 hours following irrigation.

Inclusion criteria

1. Patients 14-60 years of age visiting the out patient department.
2. All single rooted Maxillary and Mandibular teeth with necrotic pulps assessed by electric pulp test.
3. Both genders.
4. Teeth with closed apices assessed by radiograph.
5. Patients not taking analgesics and antibiotics.

Exclusion criteria: Previous endodontic treatment.

Statistical analysis: Data was evaluated and analyzed in statistical software SPSS version 17.0.Quantitative data like age and post debridement pain was presented in the form of Mean±SD.t-test was used to determine the significant difference of mean pain scores in both groups.

RESULTS

Total 710 patients were included in the study who had single rooted Maxillary and Mandibular teeth with necrotic pulps assessed by electric pulp test. Mean age of patients in Group-I and in Group-II was 30.50±11.59 and 31.15±9.80 years. In both groups minimum and maximum age of patients was 14 and 60 years respectively. Overall mean age of all 710 patients was 30.83±10.73 years.

Gender distribution in Group-I shows that there were 132(37.2%) male and 223(62.8%) female patients. In Group-II there were 154(43.4%) male and 201(56.6%) female patients.

In Group-I mean pain level in male and female patients after 24 hours was 5.72±2.24 and 6.16±2.13 while minimum and maximum pain score both in male and female patients was 0 and 9 respectively.

In Group-II mean pain level in male patients after 24 hours was 2.85±2.30 and among female patients mean pain after 24 hours was 3.05±2.10

In Group-I and Group-II mean pain score after 24 hours was 6.00±2.18 and 2.97±2.10 respectively. According to p-value mean pain level in both treatment group was statistically different at 24 hours. In Group-II mean pain score was low as compared to that of Group-I. i.e. (*p-value=0.000*) (Table-1).

Table 1: Pain after 24 hours in treatment groups

	Group-I	**Group-II**	**Total**
N	**355**	**355**	**710**
Mean	6.00	2.97	4.48
SD	2.18	2.10	2.66
Minimum	0	0	0
Maximum	9	10	10

t-test =18.46, p-value =0.000

DISCUSSION

Sodium hypochlorite (NaOCl) solution is one of the commonly used irrigant while endodontic treatment. It got various good properties such as antimicrobial and histolytic features. It also got certain disadvantages too such as cytotoxic to the periradicular tissues and pain following endodontic treatment[14-18]. 2% Chlorohexidine solution is also one of the commonly used recent irrigant while endodontic treatment. It got various good properties such as antimicrobial action and biocompatibility, however, Mohammadi and Abbott showed that despite acceptable biocompatibility, 2% Chlorohexidine solutionis potentially cytotoxic and may induce allergies[18]. Direct comparison of NaOCl and CHX in a randomized clinical trial, in terms of their influence on postoperative pain, was therefore warranted[18]. Therefore, **t**he objective was to compare the mean pain scores after debridement of pulp in patients receiving hypochlorite and chlorhexidine as intra-canal irrigant.

In this study mean pain score after 24 hours was 6.00±2.18 in Group-I (2% Chlorohexidine solution) and 2.97±2.10 in Group-II (5.25% Sodium hypochlorite). According to p-value mean pain level in both treatment group was statistically different at 24 hours. In Group-II mean pain score was low as compared to that of Group-I. i.e., (*p-value=0.000*). In comparison with other studies, Kusum Bashetty in his study showed that sodium hypochlorite (5.25%) was less effective in terms of pain control as compared to chlorhexidine solution (2%) after debridement of pulp. Results of this study are not consistent with the results reported by Kusum Bashetty. However at 6th hour Kusum Bashetty reported significant difference for pain score in both treatment groups and the pain was more in sodium hypochlorite group.

Gustavo Almeida in his study showed that sodium hypochlorite (5.25%) was equally effective in terms of pain control as compared to chlorhexidine solution (2%) after debridement of pulp. There were no statistically significant differences in postoperative pain between the 2 groups at any time point ($p > 0.05$)[19].

According to the results of a local study an average of 48.35% patients having no pain at all after first appointment. Pain scale readings showed that after 2 hours, 13(21.66%) patients in group I (EDTA), 13(21.66%) in group II (chlorhexidine) and 2(3.33%) in group III (hypochlorite) shows mild pain respectively. Moderate pain was recorded among 2(3.33%) patients of group I, 13(21.66%) patients of group II and 3(5%) of group III respectively. Severe pain was recorded in group III patients only (5%). A p value of .0003 was recorded on comparison[20.21.22].

CONCLUSION

Sodium hypochlorite (5.25%) is more effective in terms of pain control as compared to Chlorhexidine solution (2%) after debridement of pulp.

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