ORIGINAL ARTICLE

Assessment of the Post-Operative Pain by Using Zinc Oxide Eugenol Based Root Canal Sealer A Clinical Study

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ABSTRACT

Objective: To evaluate the post-operative pain by using zinc oxide-eugenol based root canal sealer at tertiary care Hospital.

Material and Methods: This was a cross sectional study and was performed at department of operative dentistry of Liaquat University of Medical and health Sciences Jamshoro during six months from January 2020 to June 2020. Patients presented with permanent anterior teeth with irreversible pulpitis, teeth restoration after treat of root canal and both gender were included. Several visits of endodontic treatment were performed by obturating the canals using zinc oxide eugenol (Endofill Densply Maillefer). Patients were followed for one week after obturation like on 2nd day, third day and 7th day for evaluating post-operative pain (POP). To measure POP, Visual analogue scale (VAS) was used. All the data was recorded by self-made proforma.

Results: A total of 30 patients were selected. Patients mean age was 31.07±9.69 years. Males were found in majority 66.6%. Most of the patients were presented with moderate pain and one patient with severe pain on next day and average visual analogue scale was 7.9±0.62, which was markedly decreased on 3rd post-operative day as 3.8±0.23 (most of the patients had mild pain), while on 7th post-operative day almost pain was reduced and few patients had mild pain, so average VAS was found to be 1.2±0.15.

Conclusion: Zinc oxide-eugenol based root canal sealer found to effective in the prevention of post-operative pain.

Key words: Liver cirrhosis, periodontitis, severity

INTRODUCTION

In Endodontic treatment, postoperative pain (POP) is described as an uncomfortable feeling of any severity that comes after beginning root canal treatment (RCT).[1,2] According to several research, the rate of endodontic POP ranges from 1.5% to 58%[3,4] The occurrence of POP is linked to a variety of endodontic therapy factors, such as the working length estimation using apex locator attached to each file, the frequency of visits, instruments, and root canal sealer selection.[3,5] Furthermore, a history of POP, age and gender factors, pre-operative status of pulp, the tooth type, the treatment's type (initial treatment or re-treatment), as well as history of allergic reaction can all affect the frequency of flare-up.[6] Sealers are used to protect against microbes and their byproducts from penetrating the root canal during obturation. Sealer, however, directly interacts with periapical tissues, which can induce inflammation, wound healing delays, and tissue degeneration.[6] As a result, the best root canal sealers should not be cytotoxic, mutagenic, and immunologically incompatible with periapical tissues.[6,7] A wide range of sealers with various formulations and physical qualities are available today for usage. They all, however, possess their limitations. Making a sealer with the appropriate physicochemical characteristics and long-term biocompatibility is a challenging task.[6] The origins of sealers can be traced back to Zinc oxide-eugenol (ZOE)-based preparations, which have been used in root canal obturation (RCO) for over a hundered years and are known for their antimicrobial activities.[3,8] Some sealers, including ZOE-based sealers, have in vitro been demonstrated to exhibit high cytotoxicity; however, this toxicity may not always be clinically significant.[9,10] However recently an international study observed that considering the slight microleakage and zinc oxide-eugenol's superior antibacterial property and concerning the lower cytotoxicity, the zinc oxide-eugenol (ZOE) sealer can be used for root canal obturation as an endodontic sealer.[6] However by taking above controversial findings, this study has been conducted to identify the post-operative pain zinc oxide-eugenol based canal sealer at tertiary care Hospital.

MATERIAL AND METHODS

This was a cross sectional study, which was performed at department of operative dentistry of Liaquat University of Medical and health Sciences Jamshoro during six months from January 2020 to June 2020. Study was conducted after taking ethical approval from LUMHS. Patients presented with permanent anterior teeth with irreversible pulpitis, teeth restoration after treat of root canal and both gender were included. All the cases having periodontal disease and teeth mobility, teeth with resorbed roots or incomplete formation of roots, teeth necrosis and cases who did not want to be a part of study were excluded. Written informed consent was taken from all the cases. Several visits of endodontic treatment were performed by obturating the canals using zinc oxide eugenol (Endofill Densply Maillefer). The post obturation radiographs were

done, only the obturation that 1mm short of the apex was included in the study and that with under and over extension was excluded. Patients were followed for one week after obturation like on 2nd day, third day and 7th day for the evaluation of post-operative pain (POP). Visual analogue scale (VAS) was used to measure the post-operative pain and pain was categorized as no pin, mild, moderate and severe. All the data was recorded by self-made proforma and analysis of the data was done by using SPSS version 20.

RESULTS

A total of 30 patients were selected for the assessment of postoperative pain by using zinc oxide-eugenol based canal sealer. Patients mean age was 31.07±9.69 years. Males were found in majority 20(66.6%) and females were 10(33.4%). Mostly patients 18(62.1%) belongs to urban areas and 11(37.9%) were from rural areas. Out of all 16(53.3%) patients were married and 14(46.4%) were unmarried. Table.1

POP was assessed by VAS. Mostly patients were presented with moderate pain and one patient with severe pain on next day and average visual analogue scale was 7.9±0.62, which was markedly decreased on 3rd post-operative day as 3.8±0.23 (most of the patients had mild pain), while on 7th post-operative day almost pain was reduced and few patients had mild pain, so average VAS was found to be 1.2±0.15. Table.2

Table 1: Descriptive statistics of age and gender n=30

Variables		Statistics
Age (mean±SD)		31.07±9.69 years
Gender	Males	20(66.6%)
	Females	10(33.4%)
Residence	Urban	18(62.1%)
	Rural	11(37.9%)
Marital status	Married	16(53.3%)
	Un-married	14(46.4%)

Table 2: Descriptive statistics of post-operative pain n=30

Post-operative days	Statistics
Postoperative on 2nd day (VAS)	7.9±0.62
Postoperative on 3rd day (VAS)	3.8±0.23
Postoperative on 7th day (VAS)	1.2±0.15

DISCUSSION

Post-obturation pain irritates both the patients and the dentists. However, by using modern endodontic methods, it may become less common. In this study mostly patients were presented with decreased severity of pain and one patient had severe pain on next day and average visual analogue scale was 7.9±0.62, which was markedly decreased on 3rd post-operative day as 3.8±0.23 (most of the patients had mild pain), while on 7th post-operative day almost pain was reduced and few patients had mild pain, so average VAS was found to be 1.2±0.15. Similarly Javidi M et al[6] reported that the pain severity at 24 hours after therapy was much reduced in the NZOE group. On the other hand, Rewal N et al[11] reported that the overall success rates in zinc oxide eugenol group and endoflas cases were 83% and 100% respectively. In the zinc oxide eugenol (ZOE) group, the instant postoperative extractions may be explained by the fact that ZOE is a periapical irritant, and extreme caution should be exercised to avoid placing material beyond the apex. [18] Moreover, its antimicrobial efficacy is limited.[11,12] In primary teeth, the use of root canal filling materials eliminate microbes in tissues, because full mechanical debridement remains impossible because of the intricacy of the root canal.[11] The study of Bahrololoomi Z, et al[13] observed that the Primary molars' pulpectomy is among the most effective treatment for necrotic teeth when used with ZOE as root canal filling material. Other studies reported that every ZOE cement is cytotoxic, as well as cellular response caused by them may persist longer than that of other materials.[14] On the other hand, these issues are rarely visible in clinical settings, and ZOE material is perhaps the most widely used sealer.[14] The different ZOE sealers have different flow properties and setting time, therefore the formulation choice varies from case to case. Challenging canals that take longer to fill need a sealer that has a longer working time, and when heat is used in root canal filling, its effect on sealer's setting time must be considered.[14] However Rewal N et al[11] reported that at the follow-up period of 9th-month, extruded ZOE was still detected in 4 canals. In contrast, no surplus material was retained in the endoflas filled teeth. There is a controversial findings regarding long term outcome. This study has been conducted on very small sample size and mostly patients did not followed the long term follow-up, therefore large scale studies with long term follow-up are still need on this subject.

CONCLUSION

Zinc oxide-eugenol based root canal sealer found to effective in the prevention of post-operative pain. However this was small sample size study, therefore further large scale studies are suggested on this subject.

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