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Post-Operative Endodontic Pain(PEP) among Patients Visiting a Dental College in Birgunj, Nepal: A Cross-Sectional Study

MANOJ KUMAR UPADHYAY¹, KRISHAN KUMAR TYAGI²

INTRODUCTION: Post-operative Endodontic Pain (PEP) following a Root Canal Treatment(RCT) can cause discomfort to the patient as well as increase the working time of the dental clinician.

AIM: To evaluate prevalence of PEP among patients visiting the department of Endodontics, MB Kedia Dental College, Birgunj,Nepal

MATERIALS AND METHOD: This cross-sectional used a 16 item questionnaire based of VAS Scale to report pre-operative pain and PEP among patients undergoing RCT in the department of Endodontics, MB Kedia Dental College, Birgunj, Nepal. Patients were followed-up for six months for any signs of PEP. Data was Analysed using SPSS version 21.0 and Student's Paired t-test and Spearman's Correlation was used to find out significant differences, if any.

RESULTS: Of 459 subject undergoing RCT, 152 (33.1%) patients suffered from PEP associated pain during the follow-up period of six months. Males complained of a higher PEP (55.9%) as compared to females(44.1%). Patients undergoing single visit RCT complained of less pain(28.9%) and the highest incidence of PEP was seen in Maxillary Arch (87, p=0.001)

CONCLUSION: It is important for the dental clinician to take all precaution's to avoid PEP in patients, as well as the patients be made aware of PEP and its subsequent treatment protocols (Use of analgesics, reporting back to the dentist, etc.).

KEYWORDS: Post-Operative Endodontic Pain (PEP), Root Canal Treatment (RCT), Visual Analog Scale (VAS)

INTRODUCTION

Teeth are the real gems of a person's personality. A perfect smile can lead to an increased self-confidence among people.¹ However, at times the gems are affected by various factors that need urgent treatment and care. One of the most important reasons is pain, which in both chronic and acute form can lead to countless and sleepless nights if not treated properly by a dental professional.^{2,3}

The treatment of dental pain is dependent on various factors and has various treatment protocols. One of such protocol is Root Canal Treatment (RCT) of the involved tooth. An undesirable after-effect of this treatment is post-endodontic pain (PEP) both for the patient and the dental clinician. This problem is related to the induction or exacerbation of the inflammatory response in periapical tissues triggered by endodontic therapy, which stems from an injury suffered by the host.^{4,5} Various authors state that pulp therapy and root canal treatment (RCT)

cause frequent and more severe postoperative pain than other surgical procedures.⁶⁻⁸

Patients have also documented the PEP range from 25 to 40%.⁹⁻¹¹ Endodontists are currently divided regarding differences in PEP due to single or multiple RCT procedures.^{12,13} Both procedures have their own indications and treatment protocols wherein a Single RCT procedure is usually preferred in clinical conditions such as vital tooth, lack of apical periodontitis and absence of bleeding. On the contrary, a Multiple RCT procedure is preferred in cases where there are unfavourable conditions like bleeding pulp, presence of an apical lesion, aberrant anatomy of the root/canal etc.¹⁴

Literature search reveals little or no data regarding the status of PEP among the population of Birgunj, Nepal and hence, The aim of this study was therefore, to evaluate prevalence of PEP among patients visiting the department of Endodontics,

MB Kedia Dental College, Birgunj, Nepal.

MATERIALS AND METHODS

The present study was carried out among patients visiting the department of Endodontics, MB Kedia Dental College, Birgunj, Nepal from 1st March 2016 to 31st July 2016 and were followed up to 6 months for presence of PEP. Patients indicated for Root Canal Treatment (RCT) of one tooth, aged 18 years or above, giving no history of any RCT in the last six months, willing to participate in the study and agreeing to scheduled follow up calls were included in the study. Patients unwilling to participate, suffering from any systemic disease or undergoing more than one RCT procedure were excluded from the study.

The study protocol was duly presented to the Institutional Review Board and an Ethical Clearance was obtained. A written, informed consent was also obtained from the study participants after explaining them the study protocol. The patients were assured of confidentiality of their data.

Data was obtained with the help of a 16-item questionnaire that recorded the patient's demographic characteristics, history of pre-operative pain and presence of post-operative pain (using a VAS scale) upon subsequent follow-up (those who were unable to come to the clinic were asked about their PEP over the phone) and history of treatment in the last six months for the particular tooth. Whenever required, the help of an IOPAR was taken to check for the reason of PEP.

Data was entered in to Microsoft excel, which was duly transferred into SPSS Version 21.0¹⁵ and paired student's t-test and spearman's correlation were applied for finding out significant differences, if any.

RESULTS

The distribution of both pre-operative and post-operative pain according to gender is depicted in table 1. Of a total sample size of 459 patients, 233 were males while the remaining 226 were females. Pre-operative pain was seen in 320 (69.7%) patients while PEP was seen in 152(33.1%) of the patients. Most the PEP was seen in males (36.5%) as compared to females (29.6%). Also, differences

in pre-operative and PEP were found to be significant ($p=0.033$).

The distribution of PEP according to maxillary and mandibular arches is displayed in figure 1 and it has been revealed that in both maxillary and mandibular arches, the posterior teeth(90,59.2%) were more affected as compared to anterior teeth(62, 40.8%).

The division of PEP according to the number of visits (single/multiple) is displayed in table 2. It was a general observation that most of the anterior teeth in both the arches were treated in a single visit while the posterior teeth took multiple visits. Significant differences were observed in treatment of maxillary anterior teeth ($p=0.02$) and mandibular posterior teeth ($p=0.03$) according to the number of visits involved.

Table 3. depicts the differences in PEP according to maxillary and mandibular teeth. A significant difference was observed between both the arches ($p=0.001$). The r value was 0.74 which showed a nearly positive relation between both the arches.

DISCUSSION

The present study, evaluates the prevalence of PEP among patients visiting the department of Endodontics, MB Kedia Dental College, Birgunj, Nepal as 33.1%. with males (55.9%) complaining of more PEP as compared to their female counterparts(44.1%). The prevalence of PEP varies from author to author as our results vary upon comparison to Ali SG et al.¹⁶ (4%) and Gotler M et al.⁸ (63.8%). It has been stated by various authors that the success and failure of endodontic treatment is determined by long-term results and not the presence or absence of short-term post-operative pain¹⁷ and hence, the study adopted a follow-up period of six months.

PEP according to location of the tooth is also important. The Present study reported the highest incidence of pain among both maxillary and mandibular posteriors (90,59.2%) and were in agreement to Chiconelli et al. who reported a PEP of 38% in endodontically treated molars.⁵ This could be attributed to difficulty in access to molars, greater incidence of curved/tortuous canals, and sometimes, inability to detect and obturate an extra canal in the molars.¹⁸ Also, the

mandible has a dense trabeculae pattern, that leads to reduced blood flow which, in turn causes an increased localization of infection and inflammation that could delay healing.¹⁶ The same reason could be applied to the results of the present study where significant differences ($p=0.001$) were seen in PEP among mandibular and maxillary RCT Treated teeth.

The presence of PEP according to the number of visits is also an important factor. While anterior teeth are preferred for a single visit treatment, the presence of an apical lesion/ or any other factor that renders the clinician unable to carry out the RCT in a single sitting. The present study reported a lower incidence of PEP in patients undergoing a single visit treatment (28.9%) as compared to teeth being treated for multiple visits (71.1%), the results are contradictory to various authors who state that single-visit treatment shows a higher frequency of PEP, leading to patients resorting to the use of analgesics for relieving their pain.^{8, 19-21}

The study is prone to the limitation that patient's perception towards PEP over the phone could vary (286 people) Also, it could not be ascertained that the pain was due to the RCT or any other dental factor/ problem. However, Self-reported data used in this study was to only explore the underlying cause and suggests further studies to be conducted in Nepal on PEP among patients.

CONCLUSION

The prevalence of PEP among patients undergoing RCT can be attributed to various factors. However, dentists should be advised to take as many precautions as possible to prevent the incidence of PEP. Also, patients should be informed about the possibility of pain after endodontic treatment and instructed for the use of analgesics and if the pain persists, report back to their dentist for a quick diagnosis of the possible factors that caused the same.

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AUTHOR AFFILIATIONS

1. Assistant Professor, Department of Conservative Dentistry
2. Assistant Professor, Department of Oral and Maxillofacial Pathology MB Kedia Dental College Pvt. Ltd, Birgunj, Nepal

Corresponding Author:

Dr. Krishan Kumar Tyagi

Assistant Professor

Department of Oral and Maxillofacial Pathology

MB Kedia Dental College Pvt. Ltd

Birgunj, Nepal

+977 9816210299

krish.krish621@gmail.com

LEGENDS

Characteristic	Total (n)	Preoperative Pain (n)	Postoperative pain (n)	Pre-operative pain * Post-operative pain
Male	233 (50.7%)	156 (48.8%)	85 (55.9%)	0.033*
Female	226 (49.2%)	164 (51.2%)	67 (44.1%)	
Total	459(100%)	320(69.7%)	152(33.1%)	

Table 1. Distribution of pre-operative and post-operative pain according to gender

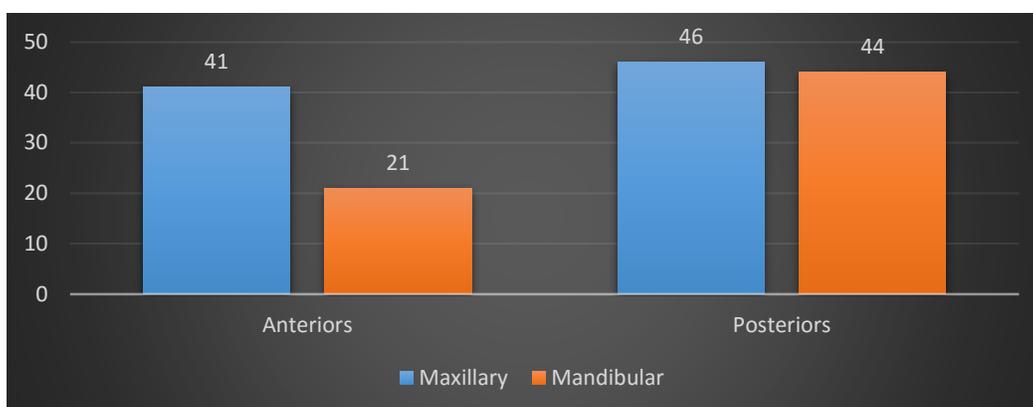


Figure 1. Distribution of PEP according to maxillary and mandibular arches

Tooth		n	Single Visit RCT	Multiple Visit RCT	P value
Maxillary	Anterior	41	31	10	0.02*
	Posterior	46	10	36	0.08
Mandibular	Anterior	21	13	8	0.65
	Posterior	44	12	32	0.03*

Table 2. Division of PEP according to the number of visits (single/multiple)

	n	p value	r
Maxillary	87	0.001*	0.74
Mandibular	65		

Table 3. Differences in PEP according to maxillary and mandibular teeth