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Assessment of incidence of apical periodontitis in root canal treated teeth: An observational study

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Abstract

Background: Apical periodontitis (AP) is a multifactorial condition resulting from the interaction of many factors, predominantly bacteria. Fewer extractions are being performed, and the prevalence of denture use is decreasing. Hence; the present study was planned for assessing the incidence of apical periodontitis in root canal treated teeth.

Materials & methods: A total of 100 patients who underwent root canal therapy in the past one year were analyzed. Only those patients were included who underwent root canal therapy for maxillary first molars and in which follow-up radiographic records were available, were enrolled. Complete demographic details and clinical profile of all the patients was recorded separately. Follow-up radiographs were analyzed and evaluated for assessing the presence of apical periodontitis. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software.

Results: Apical periodontitis were found to be present in 23 percent of the patients. While assessing the age-wise distribution of patients with apical periodontitis, non-significant results were obtained. In the present study, out of 23 patients with apical periodontitis, 13 were males while the remaining 10 were females.

Conclusion: Apical periodontitis is significantly prevalent among patients who have undergone root canal therapy.

Keywords: Apical periodontitis, Root canal treated

Introduction

Apical periodontitis (AP) is a multifactorial condition resulting from the interaction of many factors, predominantly bacteria. It is characterized by a reaction of the periapical tissues to irritants diffusing at relatively low intensity and over an extended duration from an inflamed or necrotic pulp or a failed endodontic treatment. Bacteria and their toxins can reach the pulp space *via* dental caries, trauma, or operative procedures and can then advance into the periapical tissues, where they meet the various factors of the host defense systems^[1-3].

Fewer extractions are being performed, and the prevalence of denture use is decreasing. Epidemiologic studies documented the prevalence of apical periodontitis in various populations in relation to the quality of endodontic treatment. Data from Scandinavian and other European countries show a high percentage of inadequately root filled teeth with concomitant apical pathology^[4, 5]. Hence; the present study was planned for assessing the incidence of apical periodontitis in root canal treated teeth.

Materials & methods

The present study was conducted with the aim of assessing the incidence of apical periodontitis in root canal treated teeth. A total of 100 patients who underwent root canal therapy in the past one year were analyzed. Only those patients were included who underwent root canal therapy for maxillary first molars and in which follow-up radiographic records were available, were enrolled. Complete demographic details and clinical profile of all the patients was recorded separately. Follow-up radiographs were analyzed and evaluated for assessing the presence of apical periodontitis. Briefly, apical periodontitis was judged present in teeth in which the apical part of the periodontal space was less than twice the remaining lateral ligament space and in which a radiolucency of more than twice the width of the lateral periodontal ligament space was associated with the apical portion of the root. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test

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was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

Results

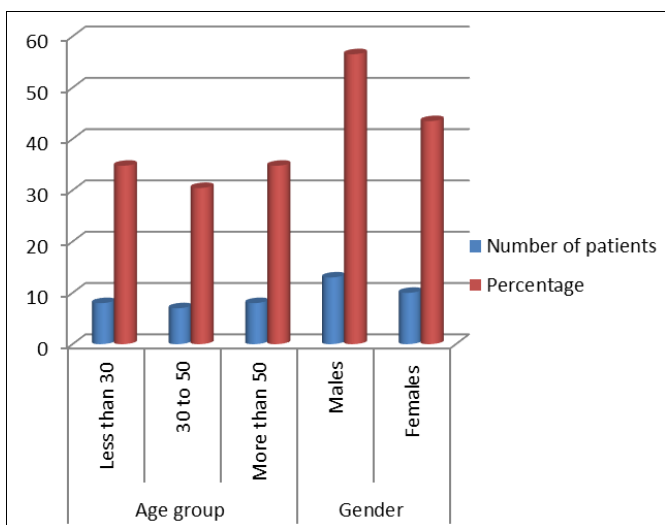
In the present study, a total of 100 patients who underwent root canal therapy were analyzed. Apical periodontitis were found to be present in 23 percent of the patients. While assessing the age-wise distribution of patients with apical periodontitis, non-significant results were obtained. In the present study, out of 23 patients with apical periodontitis, 13 were males while the remaining 10 were females. While assessing the gender-wise distribution of patients with apical periodontitis, non-significant results were obtained.

Table 1: Prevalence of apical periodontitis among root canal treated teeth

Parameter	Number	Percentage
Apical periodontitis present	23	23
Apical periodontitis absent	77	77

Table 2: Age and gender-wise distribution of patients with apical periodontitis

Parameter		Number of patients	Percentage	p-value
Age group	Less than 30	8	34.78	0.112
	30 to 50	7	30.44	
	More than 50	8	34.78	
Gender	Males	13	56.52	0.385
	Females	10	43.48	



Graph 1: Age and gender-wise distribution of patients with apical periodontitis

Discussion

Many authors have used clinical and radiologic criteria in assessing the quality of endodontic treatment and its correlation with apical lesions. Apical radiography provides important information on the potential progression, regression and/or persistence of AP. The literature contains a number of studies that present data regarding the prevalence of AP and endodontically-treated teeth, and these vary with regard to study populations, radiographic methods and classifications of AP used [5-7]. Hence; the present study was planned for assessing the incidence of apical periodontitis in root canal treated teeth.

In the present study, a total of 100 patients who underwent root canal therapy were analyzed. Apical periodontitis were found to be present in 23 percent of the patients. While

assessing the age-wise distribution of patients with apical periodontitis, non-significant results were obtained. Chala S *et al.* assessed the prevalence of apical periodontitis and identifying the factors associated with apical periodontitis, particularly the influence of the quality of root canal fillings and coronal restorations on the periradicular status. The study population consisted of adult patients, men and women, seeking routine dental care at the Endodontic Clinic in the school teaching hospital between September 2006 and July 2008. For each patient complete oral examination and periapical radiographs were made for pathological teeth. All teeth were assessed individually. AP was diagnosed according to defined criteria, other variables were root fillings, coronal fillings, trauma and caries. The odds ratio and 95% confidence interval were used to calculate the risk of apical periodontitis related to tooth-specific risk indicators on the presence of apical periodontitis. A multiple logistic regression model to control for confounders and to determine their independent association with apical periodontitis was used also. AP was detected on teeth (63.79%). The prevalence of apical periodontitis in root canal-treated teeth was 39.5%. Of the dental variables caries, trauma, inadequate root fillings and inadequate restoration were significantly associated with AP. The prevalence of AP in the study group was higher than in other populations. The probability of AP increased significantly after root canal treatment and coronal filling and was closely associated with the quality of the filling [8].

In the present study, out of 23 patients with apical periodontitis, 13 were males while the remaining 10 were females. While assessing the gender-wise distribution of patients with apical periodontitis, non-significant results were obtained. Kim S investigated the prevalence of apical periodontitis among root canal-treated teeth in an urban South Korean population. The periapical status of 896 root canal-treated teeth was evaluated by using digital panoramic radiography. Five prognostic factors were analyzed: length and density of the root filling, presence of crown restoration, probability of unilateral bite, and presence of missing canals. The prevalence of apical periodontitis among root canal-treated teeth in the study population was 22.8%, and 29.3% of these teeth had received dental treatment for pain relief. Evaluation of the prognostic factors indicated that inadequacy of endodontic treatment was more predictive of apical periodontitis than the absence of a crown restoration. Inadequate root filling length appeared to be the most important prognostic factor related to apical periodontitis and its acute symptoms among root canal-treated teeth [9].

Huunonen S *et al.* assessed the prevalence of apical periodontitis in the Finnish population aged 30 years and older and relate it to the technical quality of root filling by the type of tooth. As part of the Finnish nationwide Health 2000 study, panoramic radiographs were used of the dentate subjects (n = 5335) aged 30-95 years (mean 50.2 years) to assess the apical and endodontic status of their teeth (n = 120635). Apical periodontitis (AP) was recorded when the periodontal ligament space was more than double in width, or loss of lamina dura or a periapical radiolucent lesion was seen. Technically, adequate root fillings had a gap of 0-3 mm from the apex; all others were defined as inadequate. Teeth with AP occurred in 27% of the dentate subjects being more prevalent in subjects with root filled teeth than in those without. AP was more prevalent in men than in women (31% vs. 23%). At a tooth level, AP was most frequent in mandibular molars with inadequate root fillings. For all root filled teeth, an inadequate root filling doubled the risk of AP

for both women and men. AP occurred principally in subjects and teeth with root fillings. Inadequate root fillings doubled the risk of AP ^[10].

Conclusion

From the above results, the authors conclude that apical periodontitis is significantly prevalent among patients who have undergone root canal therapy. However; further studies are recommended.

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