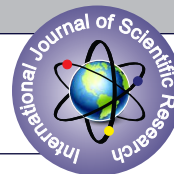


PREVALENCE OF APICAL PERIODONTITIS AND ENDODONTIC TREATMENT IN ADULT POPULATION OF SULLIA: A RADIOGRAPHIC STUDY



Dental Science

Dr. Krishna Prasada L

Professor and head of the department, Dept of conservative dentistry and Endodontics K.V.G Dental College and Hospital, Sullia.D.K. Karnataka. INDIA.574327

Dr. Suhas K*

Post Graduate Student Dept of conservative dentistry and Endodontics K.V.G Dental College and Hospital Sullia.D.K. Karnataka. INDIA.574327 *Corresponding Author

ABSTRACT

Despite numerous studies on the prevalence of apical periodontitis (AP) associated with pulpitis in diverse geographical populations, there are currently no data on the prevalence of these conditions in populations of adults native of Sullia. The purpose of our research was to address this anomaly by investigating AP associated with pulpitis in an adult Sullia population based on radiographic examination.

The sample used for this study consisted of randomly selected individuals referred KVG DENTAL COLLEGE AND HOSPITAL, SULLIA in the years 2016-2017. Orthopantomographs of 200 patients were evaluated. The periapical status of all teeth (with the exception of third molars) was examined according to Ørstavik's Periapical Index. The quality of the root canal filling was rated as 'adequate' or 'inadequate' based on whether all canals were filled, the depth of fill relative to the radiographic apex and the quality of compaction (absence/presence of voids). Data were analyzed statistically using the Chi-square test and calculation of odds ratios.

The findings of this study demonstrate that Apical Periodontitis is less prevalent in the surveyed adults of Sullia population (2.8%) than in other populations. The total percentage of endodontically treated teeth was 2.5%, which is low compared with the results of some other studies

KEYWORDS

endodontics, epidemiology, periapical disease, radiographic evaluation, root canal treatment

INTRODUCTION

Apical periodontitis (AP) is a multifactorial condition resulting from the interaction of many factors, predominantly bacteria^[1]. 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^[2]. The endodontic environment provides a selective habitat for the establishment of a mixed, predominantly anaerobic flora. Collectively, this habitat-adapted polymicrobial community residing in the root canal, has several biological and pathogenic properties, such as antigenicity, mitogenic activity, chemotaxis, enzymatic histolysis, and activation of host cells^[3]. The biological and therapeutic aim of endodontic treatment is either to prevent AP or to create optimal conditions for healing, based on the removal of infection and elimination of bacteria from the root canal system and prevention of re-infection. Endodontic treatment is widely recognized as a highly intricate task and epidemiological studies report that the frequency of teeth containing poor quality endodontic treatments is high^[4-6]. The success rate of endodontic therapy ranges from 86% to 98% and is directly influenced by elimination of microorganisms in infected root canals. Failure of a root filling is associated with inadequate endodontic treatment, through either technical error or difficulty in the canal system of the tooth in question. In several epidemiological studies, poor quality endodontic treatment was found to be associated with Apical periodontitis, which is commonly observed in root-filled teeth. The healing rate of patients experiencing AP after endodontic treatment in a general practice has been estimated to be as low as 50-75%^[7]. Many authors have used clinical and radiologic criteria in assessing the quality of endodontic treatment and its correlation with apical lesions. Apical radiographs provides important information on the potential progression, regression and/or persistence of Apical Periodontitis. The purpose of this study was therefore to use radiographic examination to investigate the prevalence of AP and endodontic treatment in an adult Sullia population and to reveal any correlation between these conditions.

Materials and Methods

Sample Selection

The protocols used in this study have been approved by the Institutional ethical committee, KVG Dental College & Hospital, Sullia.

The sample used for this study consisted of Soft copies of Orthopantomographs (OPGs) available in Dept. Of Oral Medicine And Radiology, KVG Dental College & Hospital, Sullia taken in a time period from June 2016 to June 2017. Orthopantomographs (OPGs) were selected by an independent observer. Radiographs of

patients less than 18 years of age and/or with less than 16 standing teeth (including third molars) were excluded. Root stumps and 3rd molars with incomplete root formation are excluded. Also excluded were any OPGs that were damaged in any way or were of poor quality (i.e. poor coverage of the periapical region, marked changes in radiographic density and images suggestive of unrelated periodontal/endodontic disease and/or post-endodontic surgical lesions). After applying the exclusion criteria, 200 OPGs were included in the study. These OPGs were examined by two independent observers. Patient related information was limited only to age and gender. OPGs were taken by post graduate student from department of Oral Medicine And Radiology, KVG Dental College and Hospital, Sullia using PLANMECA PROLINE (Generator - Constant potential, microprocessor controlled, operating frequency 80 kHz, Focal spot size 0.5 x 0.5 mm according to IEC 336, Exposure time Pan 2.5-18 s Ceph 0.2-23 s Magnification Pan constant 1.2 Ceph 1.08-1.13). All OPGs were analysed and scored using PLANMECA ROMEXIS 2.4.1.R in personal laptop.

Assessment of apical periodontitis

Teeth were categorized as endodontically treated if they had been obturated with a radio-opaque material in the pulp chamber and/or in one or more of the root canals. Radiographs were assessed for the presence and severity of AP using the method of Ørstavik et al (1986)^[8]. 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. Apical status was assessed using the PAI score^[8], according to which 5 scores were attributed to the apical area of the radiographic images, as follows: 1) normal periapical structures; 2) small changes in bone structure; 3) changes in the bone structure with little mineral loss; 4) periodontitis with well-defined radiolucent area; 5) severe periodontitis with exacerbating features. For multirrooted teeth, the root with the highest PAI score was recorded. For teeth scored 3, 4 and 5, i.e., those with chronic apical periodontitis, the abbreviation "AP" was used. For teeth with AP associated with endodontic treatment, the abbreviation "AP/ET" was used.

Assessment of endodontic treatment of teeth

The criteria used for evaluation of the quality of the root filling were modified slightly from those described by Tronstad et al.^[9] and Tavares et al.^[10], as follows: 1. Adequate: all canals obturated, no voids present, root canal fillings terminate 0-2 mm short of the radiographic apex. 2. Inadequate: root canal fillings end > 2 mm short of the radiographic apex or are grossly overfilled (i.e. extrusion of filling material through

apex), root canal fillings with voids, inadequate density, unfilled canals, and/or poor compaction.

Statistical analysis

Data were analyzed statistically using the Chi-square test and calculation of odds ratios. The Chi-square test was used to determine the significance of differences by sex, age and region for the following parameters: number of teeth with AP; number of endodontically treated teeth; and the number of endodontically treated teeth with AP. $P < 0.05$ was accepted as statistically significant.

Results

The distribution of female and male subjects is given in Table 1, subdivided by age group. There was no significant difference between males and Females in the total number of teeth present. There was no significant difference between males and Females in the total number of teeth present.

Table 1			
Distribution of patients by age group and sex			
Age group	Male	Female	Total (%)
18-30yrs	53	62	115(57.5)
31-40yrs	46	39	85(42.5)
Total (%)	99(49.5)	101(50.5)	200(100)

The overall prevalence of Apical Periodontitis in the examined teeth was 2.8% (Table 2). Of 5916 examined teeth, 148 were endodontically treated (2.5%). About 77.7% of men with endodontically treated teeth had Apical Periodontitis while only 64.7% of women had Apical Periodontitis. To test the association between prevalence of Apical Periodontitis and sex of the participant/subject, chi square test was done. And according to the test results there is no enough evidence ($p=0.12$) to say that there is significant association between Apical Periodontitis and sex of the participant.

Table 2		
Overall prevalence of Apical Periodontitis and endodontically treated teeth	Number of Teeth	Percent age
Total Number of teeth examined	5916	
Total number of endodontically treated teeth	148	2.50%
Total number of teeth with Apical Periodontitis	167	2.80%
Total number of endodontically treated teeth with Apical Periodontitis	104	70.20%

Table 3					
Distribution of endodontically treated teeth with and without Apical Periodontitis by sex					
Gender	Teeth without AP(%)	Teeth with AP(%)	Total	P value	Odds Ratio(95% CI)
Male	14(22.3)	49(77.7)	63	0.12	1.9(0.9-4.0)
Female	30(35.3)	55(64.7)	85		
Total	44(29.7)	104(70.3)	148		

Table 4					
Distribution of endodontically treated teeth with and without Apical Periodontitis by age group					
Age group	Teeth without AP(%)	Teeth with AP(%)	Total	P value	Odds Ratio(95% CI)
Less than 30	20(30.7)	45(69.3)	65	0.94	0.9(0.4-1.8)
More than 30	24(28.9)	59(71.1)	83		
Total	44(29.7)	104(70.3)	148		

Table 4					
Distribution of endodontically treated teeth with and without Apical Periodontitis by age group					
Age group	Teeth without AP(%)	Teeth with AP(%)	Total	P value	Odds Ratio(95% CI)
Less than 30	20(30.7)	45(69.3)	65	0.94	0.9(0.4-1.8)
More than 30	24(28.9)	59(71.1)	83		
Total	44(29.7)	104(70.3)	148		

Among people aged more than 30 years the prevalence of Apical Periodontitis among endodontically treated teeth was 71.1% and

among those aged less than 30 the prevalence was 69.3%. This difference was also not statistically significant with a p value of 0.94.

Discussion

The findings of this study demonstrate that Apical Periodontitis is less prevalent in the surveyed adults of Sullia population (2.8%) than in other populations. The total percentage of endodontically treated teeth was 2.5%, which is low compared with the results of some other studies. This could be a consequence of the survey population being unrepresentative of the whole population. The prevalence of AP in endodontically treated teeth is 70.2%. This prevalence was greater than that reported in Spain (64.5%) but remain considerably higher than that reported in Portugal (22%), Ireland (25%), the United States (31.3%), France (31.5%). The high rate of Apical Periodontitis in endodontically treated teeth may be the result of inadequate endodontic treatment provided by general dentists in Sullia. The quality of the root filling was frequently unsatisfactory. Only 29.8% of the root filled teeth fulfilled the criteria for an acceptable root canal filling, which is low compared with other studies. Endodontic specialists with additional training and expertise could raise the general standard of root canal treatments but there are currently very few practicing dentists with these skills in Sullia.

Conclusion

It is critical that greater attention is given to those factors responsible for the poor quality of care and the discrepancy between what is taught and expected in the undergraduate dental curriculum and the provision of root canal treatment in general practice.

REFERENCES

- Siqueira JF Jr, Rocas IN: Bacterial pathogenesis and mediators in apical periodontitis. *Braz Dent J* 2007, 18(4):267-280.
- Kakehashi S, Stanley HR, Fitzgerald RJ: The effects of surgical exposure of dental pulps in germ-free and conventional laboratory rats. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1965, 20:340-349.
- Pathogenesis of apical periodontitis And the causes of endodontic failures P.N.R. Nair Institute of Oral Biology, Section of Oral Structures and Development, Center of Dental and Oral Medicine, University of Zürich, Plattenstrasse 11, CH-8028 Zürich, Switzerland;
- Kirkevang LL, Vaeth M, Horsted-Bindslev P, Bahrami G, Wenzel A: Risk factors for developing apical periodontitis in a general population. *Int Endod J* 2007, 40:290-299.
- Al-Omari MA, Hazaa A, Haddad F: Frequency and distribution of root filled teeth and apical periodontitis in a Jordanian subpopulation. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2011, 111(1):e59-65.
- Kabak Y, Abbott PV: Prevalence of apical periodontitis and the quality of endodontic treatment in an adult Belarusian population. *Int Endod J* 2005, 38(4):238-245.
- Prevalence of apical periodontitis and endodontic treatment in a Kosovar adult population Blerim Kamberi1, Vetton Hoxha1, Miranda Stavileci1, Edmond Dragusha1, Astrit Kuçil and Lumniqe Kqiku2*
- Orstavik D, Kerekes K, Eriksen HM: The periapical index: a scoring system for radiographic assessment of apical periodontitis. *Endod Dent Traumatol* 1986, 2(20-34).
- Tronstad L, Asbjornsen K, Doving L, Pedersen I, Eriksen HM: Influence of coronal restorations on the periapical health of endodontically treated teeth. *Endod Dent Traumatol* 2000, 16(5):218-221.
- Tavares PB, Bonte E, Boukpepsi T, Siqueira JF Jr, Lasfargues JJ: Prevalence of apical periodontitis in root canal-treated teeth from an urban French population: influence of the quality of root canal fillings and coronal restorations. *J Endod* 2009, 35(6):810-813.
- Radiographic evaluation of the prevalence and technical quality of root canal treatment in a French subpopulation. Y. Boucher, L. Matossian, F. Rilliard & P. Machtou Unite de Formation et de Recherche (UFR) d'Odontologie de l'Université Paris 7, Service d'Odontologie de l'Hôtel Dieu, AP-HP, Paris, France
- Periapical health related to the quality of root canal treatment in a Belgian population AuthorsR. J. G. De Moor,G. M. G. Hommez, J. G. De Boever,K. I. M. Delmè,G. E. I. Martens
- Prevalence of apical periodontitis and frequency of root-filled teeth in an adults Spanish population Authors.A. Jiménez-Pinzón, J. J. Segura-Egea, M. Poyato- Ferrera, E. Velasco-Ortega, J. V. Ríos-Santos
- Abbott PV: The periapical space—a dynamic interface. *Aust Endod J* 2002,28(3):96-107.