PREVALENCE OF APICAL PERIODONTITIS OF AN ADULT PORTUGUESE POPULATION

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AIM

The major aim of this investigation is to determine the prevalence of endodontic treatment and the prevalence of apical periodontitis (AP) according to the Ørstavik's periapical index scoring system (PAI)[1] and estimate the index of decayed, missing and filled teeth (DMFT) in the adult population attending the clinic in the Department of Dentistry in the Faculty of Medicine at the University of Coimbra.

OBJECTIVES

The presence of AP at the time of endodontic treatment (ET) has a negative influence on prognosis[2,5]. The aim of this investigation is to estimate the prevalence of ET, the prevalence of AP in the adult population and the DMFT attending the Dental School in the Faculty of Medicine at the University of Coimbra.

METHODS

The original population was comprised of 856 individuals attending the clinic; of these, 369 adult patients were grouped based on the inclusion criteria – patients over 18 years old, with panoramic radiographs updated and dated during the period of 1 January to 31 December of 2011 and adult patients attending the clinic in the Department of Dentistry in the Faculty of Medicine – University of Coimbra. Of these, 62% (229) composed the sample for the clinical investigation. Panoramic radiographs of all 229 adult patients were analysed as well as periapical x-rays of teeth with endodontic treatment and periapical lesions previously observed in panoramic radiographs. DMTF, endodontic treatment and the quality of coronal restorations were related to the prevalence of AP. A total of 240 root-filled teeth in 229 patients were evaluated. Third molars were excluded from evaluation. Two endodontic specialists were calibrated by scoring 20 films that were not included in the main study. The value of □ was categorized in the first measurement at 0.526 (p <0.001), with moderate concordance and statistical significance, and was repeated after one week, in which the value between the observers was 0.846 (p <0.0001), reflecting a very strong level of agreement and statistical significance. Films were read on an illuminated viewbox (Kavo Dental®; Biberach, Germany) in a darkened room with magnification if needed. Periapical lesions were classified using PAI[1], and statistical analysis was performed by SPSS, version 18. Statistical tests were evaluated with the significance level of 5%.

RESULTS

The sample size was 229 patients. Distributed by gender, 39.7% were men and 60.3% were women. Ages were between 18 and 84 years.

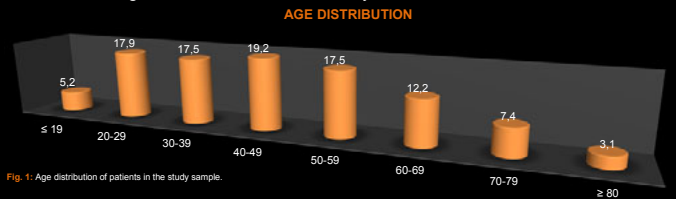

Fig. 1: Age distribution of patients in the study sample.

In terms of education, 3% of the patients were illiterate, a curious fact in contrast to 12% who have a university degree.

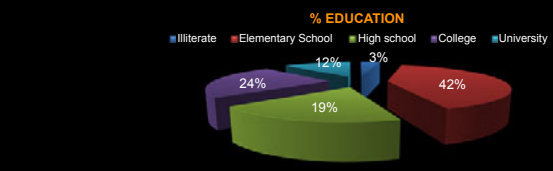

Fig. 2: Education distribution of patients in the study sample.

PREVALENCE OF AP

The prevalence of ET in the sample was 31%, and the prevalence of AP in the patients was 28.9%. A total of 4610 teeth were examined; based on this, the prevalence of AP was 3.3%, and the prevalence of AP in endodontically treated teeth was 3.5%. However, when endodontically treated teeth were examined, the prevalence of AP was 39.8%. Using the root as unit in root-filled teeth, the prevalence of AP was 53.4%.

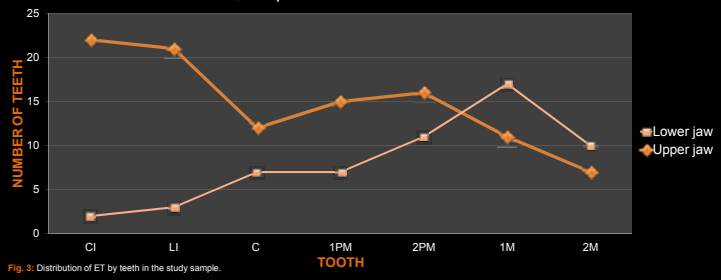

Fig. 3: Distribution of ET by teeth in the study sample.

Regarding the prevalence of endodontic treatment, the maxillary central incisor (22) was the most prevalent, unlike the mandibular central incisor (3) in the anterior sector on the global analysis. On the posterior sector, the tooth with the highest prevalence was the first mandibular molar (17), and the least prevalent was the mandibular first premolar (7). When investigated from the point of view of the DMFT index, differences on gender were not statistically significant, and the index showed an increase through life due to the cumulative effect of caries lesions.

APICAL PERIODONTITIS

Apical periodontitis may occur as a consequence of pulp infection following various insults to the dental pulp, including caries and trauma. AP most often takes the form of reactive granulomas and cysts, with resorption of bone surrounding the roots of affected teeth[2]. There is broad consensus among the studies that the presence of AP at the time of endodontic treatment has a negative influence on prognosis, which is an important issue to consider. However, in the literature the potential for an optimal outcome of endodontic treatment reaches 90%-95%[1,3,4]. This high success rate is due to endodontic treatment being performed by endodontists or undergraduate students supervised in university clinics[5,6]. Cross-sectional studies have demonstrated that the reality for the overall population might be different, with only 35%-60%[7,8,9] of the root canal-treated teeth in general practice revealing no persistent disease. On the contrary, such studies have revealed a high frequency of inadequate root fillings and of AP associated with the root-filled teeth[10,11]. This discrepancy[12] in success rates may be a repercussion of the difference in the quality of the endodontic treatment performed. This cross-sectional study determined the prevalence of AP in the adult population attending the Department of Dentistry in the Faculty of Medicine at the University of Coimbra.

PERIAPICAL INDEX OF ØRSTAVIK (PAI)

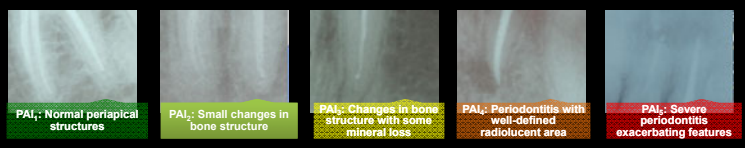

Fig. 4: Visual references of the periapical index (PAI)[1] using periapical radiographs of the study.

PERIAPICAL RADIOGRAPHS

Fig. 5: Examples of periapical radiographs obtained during the study prepared.

PANORAMIC RADIOGRAPHS

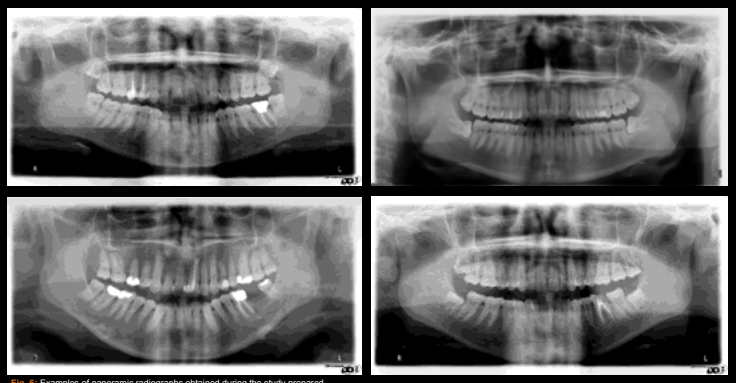

Fig. 6: Examples of panoramic radiographs obtained during the study prepared.

DISCUSSION

In examining this cross-sectional study, it is important to be aware that the use of radiographic images to detect AP requires attention. Furthermore, radiographic images have limitations for assessment as a study method, but have been used to indicate the presence of periapical infection or coronal leakage, constituting an important diagnostic resource. Previous studies have also employed periapical radiographs with the same purpose as this study. Extrapolation of these data to the general Portuguese population must be done with caution, considering all methodological implications. Furthermore, it is necessary to perform additional research in this area to assess the prevalence, severity and development of AP, such as creating indexes that enable the implementation of standardised guidelines in ET, especially with regard to the protocol for treatment of endodontic infections.

CONCLUSION

The results of the prevalence of AP in the patients' samples are similar to previous European studies, including Ireland and Norway. In addition, this cross-sectional study shows that the prevalence of endodontic treatment more than doubled, as well as apical periodontitis related to root-filled teeth, compared to a previous Portuguese study done in 1998[4], which indicates at least a more conservative treatment attitude. The flaws are present not only in teeth whose root canal treatment is inadequate, but also in teeth where endodontic treatment was properly carried out from the radiological point of view, as in both cases the presence of apical periodontitis was observed. Therefore, there is a need for the improvement of medical treatment provided to patients and the upgrading of techniques to achieve treatments with higher effectiveness, thereby promoting an increase in the success rate.

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