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INCIDENCE OF SECONDARY ROOT CARIES LESIONS IN PATIENTS REFERRED FOR TREATMENT IN THE FACULTY OF DENTAL MEDICINE – SOFIA.

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SUMMARY

Purpose: The aim of the presented study was to determine the incidence of secondary root caries lesions in patients referred for treatment in the Faculty of Dental Medicine – Sofia.

Material and Methods: The subjects who took part in the study were patients referred for treatment of caries lesions in the Faculty of Dental Medicine, Sofia. They were interviewed for smoking, presence of systematic diseases and medications and debris and plaque were removed from natural teeth prior to examination.

Dental examination was carried out with a dental mirror and a probe. Decayed, missed and filled teeth (DMFT) were recorded. Root caries lesions, restorations of those lesions and secondary caries lesions were recorded separately.

Results: A total number of 603 patients were examined. The frequency of appearance of root caries in the investigated population was 33.5% (202 patients). The whole number of root caries lesions was 857. Three hundred forty three (41.4%) of those lesions were restored. Presence of secondary caries lesions was observed in 138 cases (39.1%).

Conclusions: Based on the data obtained from the presented study it may be concluded that most of the root caries lesions remain untreated (58.8%).Secondary carious was diagnosed in 39.1% of the root caries restorations.The patients with secondary caries lesions presented with higher incidence of concomitant diseases and lower incidence of smoking.

Key words: root caries, secondary caries, epidemiology,

INTRODUCTION

Root caries has become a socially significant oral disease for the elderly due to the increased life duration and the higher number of teeth preserved for longer period [1]. It is also an increasing problem for middle aged and even younger patients undergoing treatment or management of periodontal disease as well as those with prosthodontic reconstructions [2, 3, 4]. Root caries was developed in 90% of the subjects in a twelve-year follow up study of patients treated for advanced periodontal disease [2, 5]. It was also found out that presence of four or more crowns is a risk factor for the development of root caries [4].

The operative treatment of those lesions could be compromised by the difficult access, impaired visibility, difficult moisture control, the proximity of pulp and the heterogeneous morphology of the dentine, making quality of adhesion not sufficiently predictable.[6] All these combined with the shrinkage stress generated during the polymerization of dental materials and the strain applied on the restoration/tooth contact surface during mastication due to the abfraction forces often leads to deterioration of adhesion, gap formation and secondary caries lesions. [7, 8]

The **aim** of the presented study was to determine the incidence of secondary root caries lesions in patients referred for treatment in the Faculty of Dental Medicine – Sofia, Bulgaria.

MATERIAL AND METHODS

The subjects who took part in the study were patients referred for treatment of caries lesions in the Faculty of Dental Medicine, Sofia, Bulgaria. Debris and plaque were removed from natural teeth prior to examination. All patients were interviewed for smoking, presence of systematic diseases and medications.

Dental examination was carried out with a dental mirror and a probe by the author of the study. No radiographs were taken. Decayed, missed and filled teeth (DMFT) were recorded. Root caries lesions, restorations of those lesions and secondary caries lesions were recorded separately. Root caries was registered when a soft lesion with discoloration or cavitation totally confined to the root surface or involving cement-enamel junction, but with indications that the lesion started from the root surface, were diagnosed. Recessions were measured on the vestibular and lingual surfaces if present.

A descriptive analysis of the results was done.(measurement of central tendency: arithmetic mean, median; measurements of variation: variance, standard deviation, standard mean error), the hypotheses were checked with parametric (Student t-test for two independent samples, one-way analysis of variance (ANOVA)) and non parametric (Mann-Whitney U tests, Chi-square criteria with Fisher's exact probabilities) methods. All calculations were performed by SPSS/PC v.13.0.

RESULTS

A total number of 603 patients, referred for treatment

of caries lesions in the Faculty of Dental Medicine, Sofia were examined. 212 of them were males (35.2%) and 391 (64.8%) – females. Their age varied from 25 to 85.

The frequency of appearance of root caries in the investigated population was 33.5% (202 patients). Root caries lesions and restorations of such lesions are both included as "root caries" in the conducted study. The whole number of root caries lesions was 857. The mean number of lesions per patient was 4.24. Three hundred forty three (41.4%) of those lesions were restored. The number of non-treated was 504 (58.8%). Presence of secondary caries lesions was observed in 138 cases (39.1%).

There were diagnosed significant differences in the percentage of presence of concomitant diseases when comparing average demographic data obtained from patients with restorations without secondary caries lesions and those with secondary root caries (68.4% from those with secondary lesions had concomitant diseases, compared to 51.1% for the group without secondary caries). The number of smokers prevailed in the group without secondary root caries (80.8% compared to 52.6%).The group with secondary caries presented with higher mean age (62.5 years, compared to 58.1 in the group without secondary caries) (fig. 1, fig 2). The average number of root caries lesions for the patients with secondary caries was 6.2 (varying from 2 to 15), compared to 4.6 (varying from 1 to 12) for those without. The most frequently observed size of gingival recession was 4 mm for the group with secondary lesions, the average size being 4.35 for the vestibular surfaces and 4.06 for the lingual (fig. 3, fig. 4). The average size of gingival recessions for the group with no secondary lesions was 4.24 on vestibular and 3.84 on lingual surfaces. Most frequently secondary root caries lesions were observed in quadrant 4 (fig. 5, fig. 6).

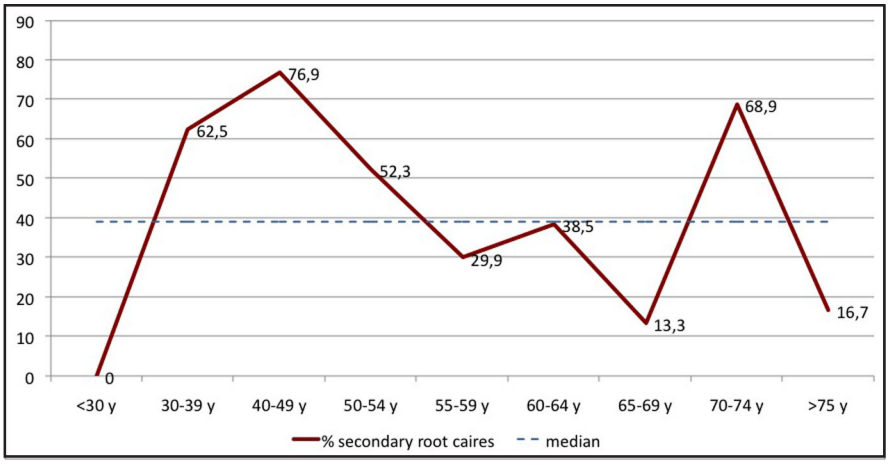

Fig. 1. Frequency of appearance of secondary caries in different age groups

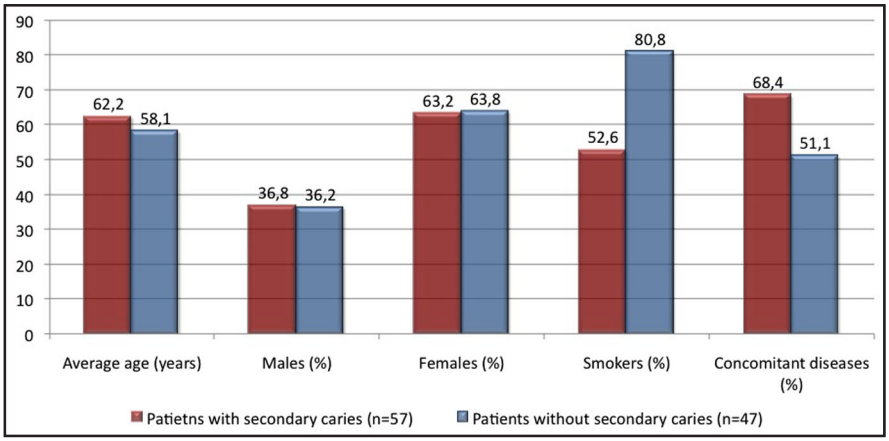

Fig. 2. Comparison of data obtained for the patients with and without secondary caries

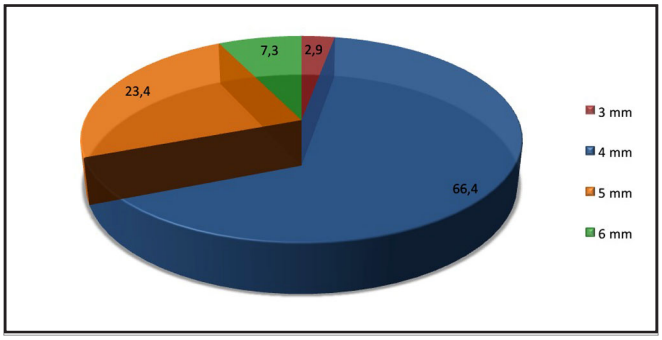

Fig. 3. Percentage distribution of different sizes of vestibular recessions in patients with secondary root caries

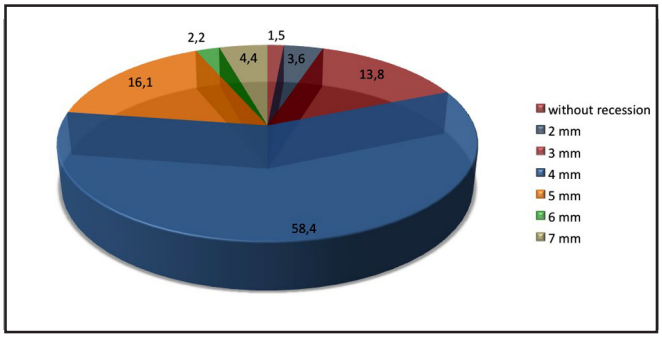

Fig. 4. Percentage distribution of different sizes of vestibular recessions in patients with secondary root caries

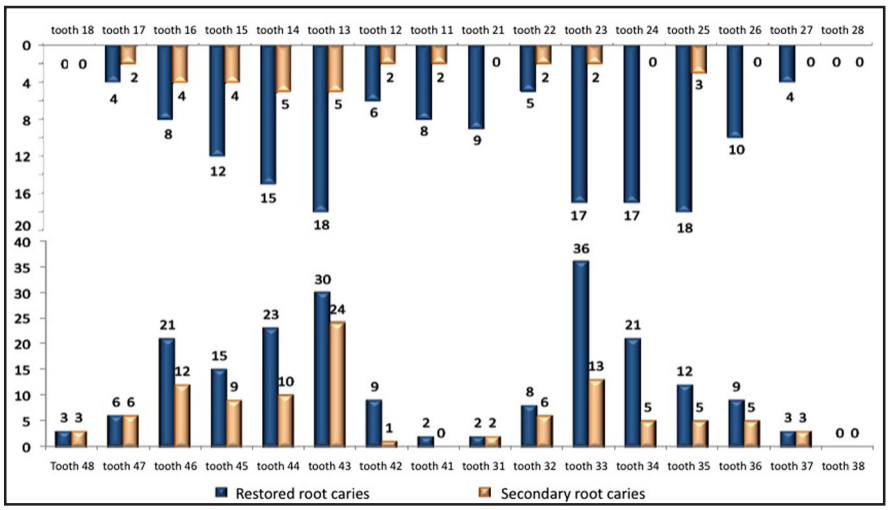

Fig. 5. Distribution of restoration and secondary caries lesions (absolute values)

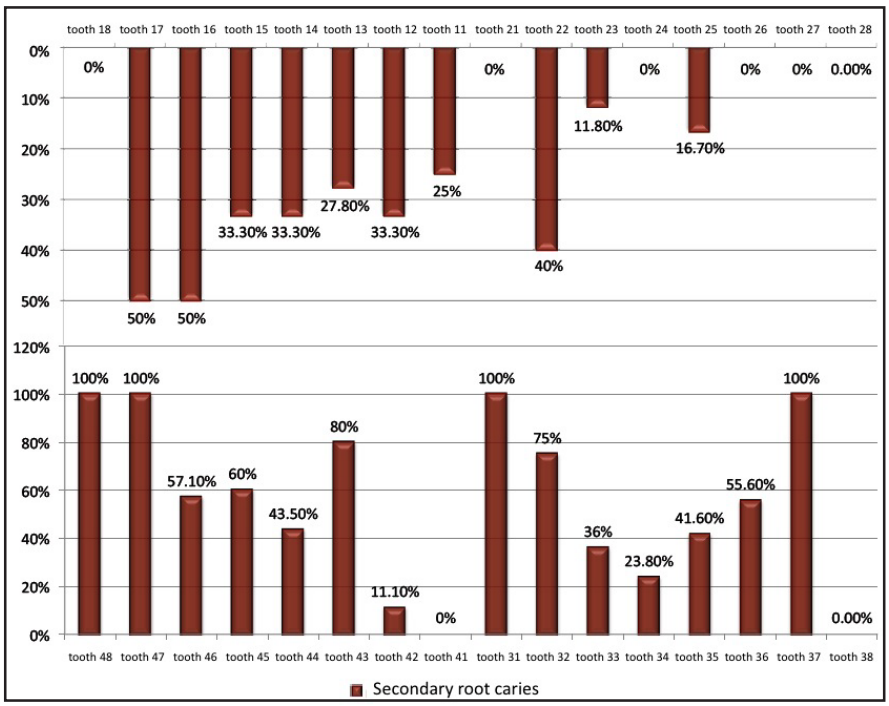

Fig. 6. Percentage distribution of secondary caries lesions

DISCUSSION

When interpreting data from the presented study it should be kept in mind that most of the participants were people with low incomes, which influences their oral status and is accepted as risk factor for the development of caries [9, 10].

The frequency of appearance of secondary caries lesions in the presented study was found out to be very high – 39.1% of the restored teeth were affected. This is an indicator that there is a serious problem in the operative treatment of root caries lesions. Most of the restorations were with esthetic restorative materials (93%). The popularity of those materials has increased significantly due to their direct-filling ability, preservation of sound tooth tissue, esthetics and the lack of need of preparation of retentions [11]. A significant advance in their properties (bonding ability, polymerization process, filling particles, interaction with tooth tissues) was done [11, 12, 13]. Despite that secondary caries and fractures still remain the main problems of those materials [13, 14, 15, 16] and frequent reason for their replacement [17].

Most frequently secondary caries was detected on the gingival side of the restorations – this could be explained with the difficulties in achieving long lasting and durable bond with dentine [15, 18], as well as the abfraction forces [8].

Concerning demographic characteristics of the group with secondary caries lesions, they presented with higher incidence of concomitant diseases. There is data in the literature that chronic diseases are risk factor for the development of root caries [10]. This could be explained with changes in saliva flow and composition due to medications necessary for their treatment, as well as oral hygiene neglect due to the presence of medical problem, affecting the general condition of the patient.

It is interesting to note that there were fewer smokers in the group with secondary caries, compared to that without. There are lots of studies in dental literature, pointing out that smoking is a risk factor for tooth loss in patients with periodontal disease [2, 5]. It could be speculated that smokers loose more teeth and for shorter intervals, so for them the chance to develop secondary lesions is smaller compared to that in nonsmokers.

The type of material used for the restoration also is of importance for the appearance of secondary caries lesion, as well as the time when the respective tooth was restored [16, 17, 19, 20]. Unfortunately we couldn't obtain reliable information concerning these two points, because the patients usually were not informed about the type of material used for the operative treatment by their dentist and they claimed not to remember when exactly the restorations were placed.

CONCLUSIONS:

Based on the data obtained from the presented study it may be concluded that:

1. Most of the root caries lesions remain untreated (58.8%).

2. Secondary carious was diagnosed in 39.1% of the root caries restorations.

3. The patients with secondary caries lesions presented with higher incidence of concomitant diseases and lower incidence of smoking.

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