ORIGINAL ARTICLE

PREVALENCE OF DENTAL CARIES IN THE PERMANENT DENTITION OF PATIENTS SEEKING ORTHODONTIC TREATMENT IN BARA KAHU

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ABSTRACT

The aim of the study was to determine the frequency and distribution of carious lesions in patients seeking orthodontic treatment. A total of 100 patients including both males and females were recruited consecutively during a one year period. Patients' pretreatment orthodontic records including charts, radiographs and photographs were examined carefully for the presence of carious lesions. Descriptive statistics were used to analyze data. Prevalence of caries was high in the maxilla as compared to mandible. Most frequently involved teeth in both the arches were first molars followed by second molars. An assessment of caries risk of the patients is mandatory before initiating orthodontic treatment in order to gain favorable outcomes of the treatment.

Key words: *Oral environment, Plaque, Mutans Streptococci*

INTRODUCTION

Dental caries is a multi-factorial disease and the outcome of a dynamic interplay between microorganisms and dietary carbohydrates. Plaque is a necessary precursor of caries and for this reason sites on teeth which favor plaque retention are particularly prone to decay. These sites include pits and fissures and proximal surfaces.[1] Apart from the susceptibility of surfaces, it has been shown that there is a hierarchy by tooth types in the pattern of dental caries. It differs not only between the maxilla and mandible but also in individual teeth. The most vulnerable teeth are the first molars and the least affected are mandibular incisors.[2,3]

Changes in the oral environment that favor plaque accumulation and retention increase the risk for developing caries. Orthodontic treatment is implicated for altering the oral environment by providing retention sites for dental plaque[4]. Although orthodontic treatment improves appearance as well as overall health, comfort, and self-esteem; like many other interventions it has inherent risks and complications. Thus, if correcting malocclusion is to be of benefit, the advantages it offers should outweigh any possible damage [5] which can be worse if there is damage before the start of orthodontic treatment. The aim of the study was to determine the frequency and distribution of carious lesions in patients seeking orthodontic treatment at Islamabad Dental Hospital, Bara Kahu.

METHODOLOGY

The study consisted of 100 patients, age 8–34 years, with a median age of 19 years. They were recruited consecutively during a one year period at the Orthodontic Department, Islamabad Dental Hospital. The patients' pre-orthodontic examination charts, panoramic radiographs, and intra-oral photos were examined. Before bonding, the records, intra-oral photos, and the orthopantomographic radiographs were checked

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carefully for caries lesions. All data were then inserted into the computer program (SPSS-version 17) to produce a graphic image that illustrates the frequency and pattern of caries as a percentage value.

RESULTS

Out of the total 100 patients, 60 were females and 40 were males. The age of the patients ranged between 8-34 years with a median age of 19 years. Interarch comparison showed that the frequency of caries was more in the maxilla than in the mandible. In the maxilla, the commonly affected teeth were first molars followed by second molars, third molars, premolars and then canines and incisors (Figs 1 & 2).

On evaluating the mandibular teeth, the frequency was greatest in first molars followed by second molars and then third molars and second premolars. Mandibular first premolars, canines and incisors were spared (fig 3).

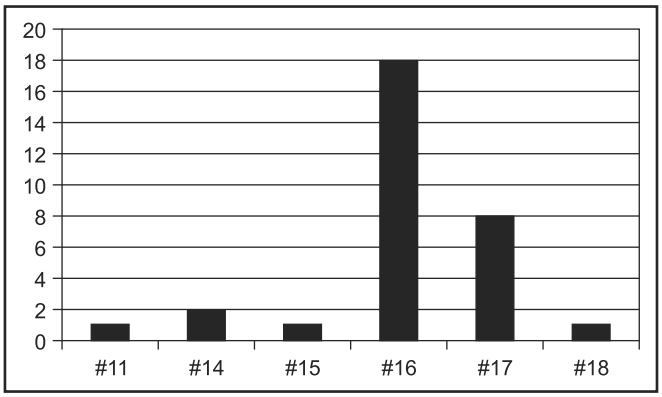

Fig 1: Distribution of caries in the maxillary right quadrant

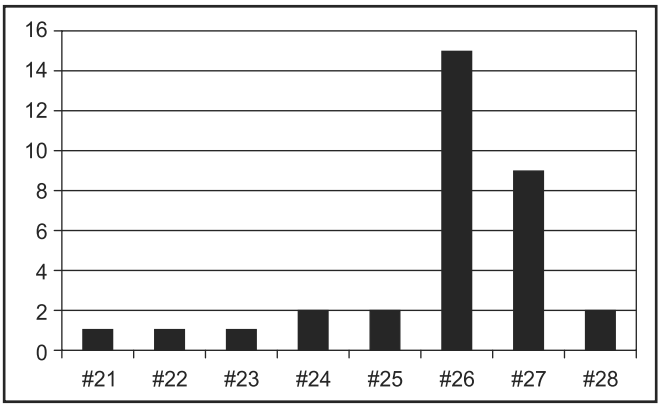

Fig 2: Distribution of caries in the maxillary left quadrant

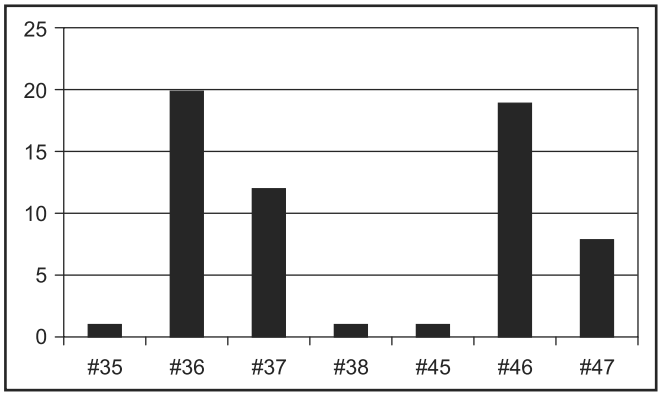

Fig 3: Distribution of caries in the mandibular arch

DISCUSSION

Besides the main etiological factors, other factors are also involved in development of caries. Patients undergoing ûxed appliance treatment often have high salivary and plaque counts of mutans streptococci due to a favorable environment for the accumulation of microorganisms and food particles,[6] which increases the caries risk.[7] The orthodontic patients exhibit a significant increase in salivary flow rate, suggesting that fixed orthodontic appliances are not the sole factor increasing the patient's caries risk during orthodontic treatment.[8] In this study, we evaluated the distribution of caries in the oral cavity before initiating orthodontic treatment. We found a higher prevalence of caries in the maxillary arch than in the mandibular arch. This finding contradicts with the results of previous studies which report a higher frequency of caries in the mandible.[2, 3] The discrepancy in results may be due to the fact that our studied population comprised of patients having malocclusions and studies have reported a higher frequency of severe crowding and contact point displacements in the maxilla[9] which makes maxillary teeth more prone to caries. In the current study, the most frequently involved teeth in both the arches were first molars followed by second molars. These findings corroborate previous results.[3, 10, 11] The increased incidence of caries in first molars is probably explained by the early eruption of these teeth in the oral cavity when oral hygiene is often neglected and the child lacks the manual dexterity of brushing. In our study, mandibular incisors, canines and first premolars had no carious lesions which further support the findings of lower prevalence of crowding in the mandibular anterior teeth.[9]

The ûndings in the present study demonstrate the importance of caries risk assessment in orthodontic patients. Combination of many newly erupted teeth and a lack of proper oral hygiene constitute a major caries risk. These patients need proper information, especially as orthodontic treatment is becoming a common procedure in Pakistan and is gaining in popularity. Most orthodontists agree that patients seeking orthodontic treatment run a high risk of developing caries,[12,13] and patients who already have carious lesions before the start of orthodontic treatment therefore have an even greater chance of developing new cavities. The knowledge about the prevalence and the specific intraoral pattern of distribution of caries can assist in diagnosing and adopting preventive measures before and during orthodontic treatment to achieve an uneventful, secure, and successful final result.

CONCLUSION

Demineralization during orthodontic treatment is a significant clinical problem. Rarely, attempts to correct malocclusion can leave the patient worse off than before treatment. To overcome this problem, the best strategy would be an evaluation of the caries risk of the patients prior to banding. It should include recording and correcting the already existing lesions along with patients' salivary, microbial and diet analysis. Good clinical practice,[14] careful patient assessment, and good cooperation and understanding between all parties are prerequisites to minimizing damage.

REFERENCES

1 Mc Donald SP, Sheiham A. The distribution of caries on different tooth surfaces at varying levels of caries- a compilation of data from 18 previous studies. Community Dental Health 1992;9: 39-48.

2 Saravanan S, Madivanan I, Subashini B, Felix JW. Prevalence pattern of dental caries in the primary dentition among school children. Indian J Dent Res 2005; 16:140-46.

3 Kutesa A, Mwanika A, Wandera M. Pattern of dental caries in Mulago Dental School clinic, Uganda. Afr Health Sci 2005; 5: 65-68.

4 Edith LC, Montiel-Bastida NM, Leonor SP, Jorge AT. Changes in oral environment during four stages of orthodontic treatment. Korean J Orthod 2010; 40: 95-105.

5 Shaw WC, O'Brien KD, Richmond S, Brook P. Quality control in orthodontics: risk/benefit considerations. Br Dent J 1991; 170:33-37.

6 Al-Musallam TA, Evans CA, Drummond JL, Matasa C, Wu CD. Antimicrobial properties of an orthodontic adhesive combined with cetylpyridinium chloride. Am J Orthod Dentofacial Orthop. 2006; 129:245–51.

7 Anhoury P, Nathanson D, Hughes CV, Socransky S, Feres M, Chou LL. Microbial proûle on metallic and ceramic bracket materials. Angle Orthod. 2002;72:338–43.

8 Ulukapi H, Koray F, Efes B. Monitoring the caries risk in orthodontic patients. Quintessence Int. 1997 Jan;28(1): 27-29.

9 Lux CJ, Ducker B, Pritsch M, Niekush U. Space conditions and prevalence of anterior spacing and crowding among nine years old school children. Journal of Orthodontics 2008; 35: 33-42.

10 Khan AA, Jain SK, Shrivastav A. Prevalence of dental caries among the population of Gwalior (India) in relation of different associated factors. Eur J Dent 2008; 2: 81-85.

11 Togoo RA, Yaseen SM, Zakirullah M et al. Prevalence of first permanent molar caries among 7-10 years old school going boys in Abha City, Saudi Arabia. J Int Oral Health 2011; 3: 30-34.

12 Derks A, Kuijpers-Jagtman AM, Frencken JE, Van't Hof MA, Katsaros C. Caries preventive measures used in orthodontic practices: an evidence-based decision? Am J Orthod Dentofacial Orthop. 2007; 132:165–70.

13 Dearing S, Healey D, Kean M. Beneûts and risks of orthodontic treatment. Report of the 2005 NZAO Symposium. N Z Dent J. 2007; 103:28–33.

14 BOS Orthodontic Records 1999. Orthodontic records: collection and management. Development and standards committee of the British Orthodontics Society; 1999.