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ORIGINAL ARTICLE

Prevalence of Caries in Anterior Teeth in Adults; An Epidemiology Study

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ABSTRACT

Background and Aim: Dental caries is a multifactorial, widespread chronic infection of the enamel, or dentin caused by plaque. Susceptible tooth surfaces, saliva, oral micro flora, and dietary carbohydrates are the main factors involved in the development of dental caries. Treatment and prevention management of caries among the population is measured in terms of prevalence and severity of anterior teeth caries. The present study's aim was to determine the prevalence of anterior teeth caries among adults.

Methodology: This epidemiological study was conducted on 1276 patients reporting for treatment at the College of Dentistry, Jouf University, Saudi Arabia from January 2021 to July 2021. Detection of carries was carried out as per World Health Organization (WHO). Based on demographic details such as age, gender, occupation, and diet, the prevalence of carious anterior teeth was assessed. All the data was coded and analyzed using SPSS version 24.

Results: Out of 1276 patients, male and female patients were 814 (63.8%) and 462 (36.2%) respectively. The incidence of carious anterior teeth was 263 (32.2%) in males whereas 149 (32.3%) in female patients. The overall incidence of carious anterior teeth was 32.25%being prevalent in male patients with an age range from 21 years to 30 years. A significant association was found among carious anterior teeth, age ($p<0.05$), diet ($p<0.05$), location ($p<0.05$), teeth malalignment ($p<0.05$), and oral hygiene ($p<0.05$). However, anterior decay had no significant association with gender ($p=0.673$) and occupation ($p=.167$). Maxillary central incisors were the commonly affected teeth in most cases.

Conclusion: Our study found that the prevalence of carious anterior teeth was 32.25% and Maxillary central incisors were the commonly affected teeth in most cases. A significant association was found among carious anterior teeth, age, location, oral hygiene, diet, and teeth malalignment. But no significant association among carious anterior teeth, occupation, and gender.

Keywords: Anterior caries, prevalence, dental caries

INTRODUCTION

Dental caries is tooth surface dissolution caused by localized chemicals due to metabolic events biofilm covering the affected area. It can be termed as teeth calcified tissue chronic infection caused by commensal flora microbial agents which begins with enamel surface layer demineralization and proceeded to dentin causing inflammation of the pulp and eventually necrotic [1, 2]. Dental caries is a multifactorial chronic infection of the oral cavity caused by plaque. Dietary carbohydrates, oral micro flora, saliva, and susceptible tooth surfaces have been identified as factors promoting the progression of dental caries [3]. Caries is known to manifest themselves as reversible white spot lesion. However, as the disease progresses to cavitation, it becomes irreversible [4]. Some areas of the tooth surface, such as the pits and fissures on the occlusal surface and the proximal tooth surfaces, are more prone to demineralization. Also, because of the large amount of saliva produced by the submandibular salivary glands in that area, the lower incisors are less susceptible to caries. Dental caries is also known to be caused by Xerostomia and frequent radiation exposure [5]. Giugliano et al. conducted a study that found that the frequency of sugar intake is more important than total sugar consumption in the development of dental caries [6].

Streptococcus sobrinus and Streptococcus mutans of mutans streptococci are associated with caries root surface and high proportional enamel initiations. Streptococcus mutans free dental plaque can be associated with dental caries [7] whereas caries extension to dentine could be related to Lactobacillus species instead of the initial phase of the disease. Various explanations for the disparities in caries susceptibility have been anticipated, such as differences in surface morphology of tooth or post eruptive maturation of enamel [8]. The tooth surface proneness to caries changes over time [9]. It was discovered that predisposition to caries is low during the first post-eruptive year, but rapidly increases to the maximum rate later [10]. Dental administrators can use the patterns information on surface-specific dental caries to help them decide which preventive strategies to use [11]. The severity and prevalence of caries could be a foundation for caries prevention and treatment quality and magnitude needed for population affecting individual life aesthetic and quality. Therefore, an attempt was made to determine the prevalence of carious anterior teeth in adults.

METHODOLOGY

This epidemiological study was conducted on 1276 patients reporting for treatment at the College of Dentistry, Jouf University, Saudi Arabia from January 2021 to July 2021. Detection of carries was carried out as per World Health Organization (WHO). Based on demographic details such as age, gender, occupation, and diet, the prevalence of carious anterior teeth was assessed. Ethical approval was taken from the institutional ethical committee of Jouf University. Clinical examination was carried out with materials such as dental floss, mouth mirror, illuminating light, explorer, cotton roll, and teeth separating wedge. Under good illumination, carious anterior teeth were examined. Initially, caries teeth were recognized, and diagnosed based on clear evidence of tooth substance loss. Caries was not considered to be white or brown spots in enamel whose surfaces remained intact and glossy. Caries was recorded as the lesion presence was detected in a fissure or pit or detectable softened floor on the smooth surface under the softened wall or under-mind enamel. Lesion entrance verified with explorer on proximal surfaces. The Friedman test and Dunn's Multiple Comparisons test were used to determine statistical significance of differences in caries incidence between surfaces of individual teeth (if P.05). The prevalence of caries differences of individual tooth surfaces between males and females were compared with the Pearson Chi-Square test and Fisher's Exact Test. All the gathered data was coded and analyzed in SPSS version 24 for the prevalence of anterior teeth caries evaluation with age, diet, gender, and occupation.

RESULTS

Out of 1276 patients, male and female patients were 814 (63.8%) and 462 (36.2%) respectively. The incidence of carious anterior teeth was 263 (32.2%) in males whereas 149 (32.3%) in female patients. The overall incidence of carious anterior teeth was 32.25% being prevalent in male patients with an age range from 21 years to 30 years. A significant association was found among

carious anterior teeth, age (p<0.05), diet (p<0.05), location (p<0.05), teeth malalignment (p<0.05), and oral hygiene (p<0.05). However, anterior decay had no significant association with gender (p=0.673) and occupation (p=.167). Maxillary central incisors were the commonly affected teeth in most cases. Gender distribution is shown in Figure-1. Figure-2 Illustrates the presence of carious anterior teeth among the total population. Table-1 shows the prevalence of anterior teeth caries among the male and female populations. Prevalence of anterior teeth caries with respect to the age group is demonstrated in Figure-3. The distribution of carious anterior teeth with diet, occupation, and oral hygiene is shown in Figure-4, Table-2, and Tabe-3 respectively. The prevalence of carious anterior teeth in individual tooth numbers is shown in Figure-5.

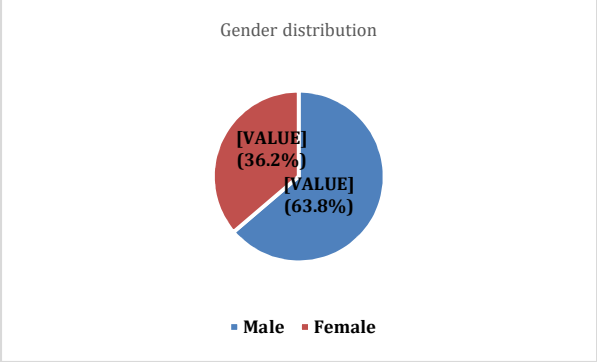

Figure-1: Gender distribution (n=1276)

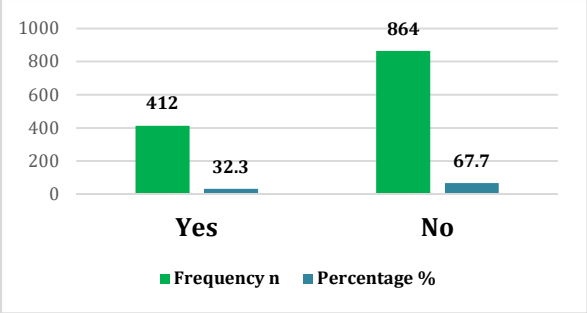

Figure-2: Carious anterior teeth prevalence (n=1276)

Table-1: Prevalence of carious anterior teeth among male and female patients (n= 1276)

Gender	Presence of Carious anterior teeth n (%)	Absence of Carious anterior teeth n (%)	Total n (%)
Male	263 (32.2)	551 (67.7)	814 (100)
Female	149 (32.3)	313 (67.7)	462 (100)

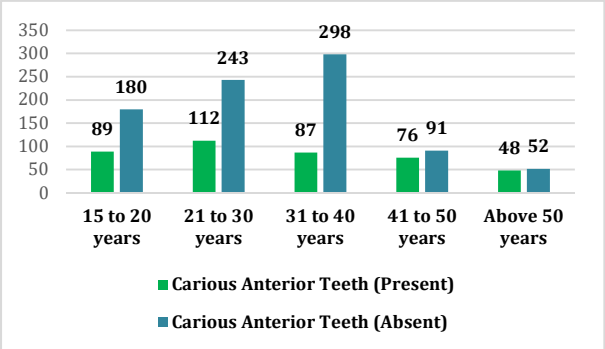

Figure-3: Prevalence of carious anterior teeth among age groups (n=1276)

Table-2: incidence of carious anterior teeth as per occupation (n=1276)

Occupation	Carious anterior teeth Present n (%)	Carious anterior teeth Absent n (%)	Total n (%)
Student	134 (32.5)	347 (40.2)	481 (72.7)
Business	128 (31.1)	237 (27.4)	365 (58.5)
Housewife	119 (28.9)	198 (22.9)	317 (51.8)
Others	31 (7.5)	82 (9.5)	113 (17)

Table-3: Carious anterior teeth prevalence as per oral hygiene (n=1276)

Habits of Oral Hygiene	Carious anterior teeth Present n (%)	Carious anterior teeth Absent n (%)	Total n (%)
Types of Brushing	381 (29.9)	755 (59.2)	1136 (89.1)
Tooth and Paste	31 (2.4)	109 (8.5)	140 (10.9)
Others	412 (32.3)	864 (67.7)	1276 (100)
Total			
Frequency of Brushing	349 (27.4)	594 (46.6)	943 (73.9)
Once	56 (4.4)	239 (18.7)	295 (23.1)
Twice	7 (0.5)	31 (2.4)	38 (2.9)
More	412 (32.3)	864 (67.7)	1276 (100)
Total			

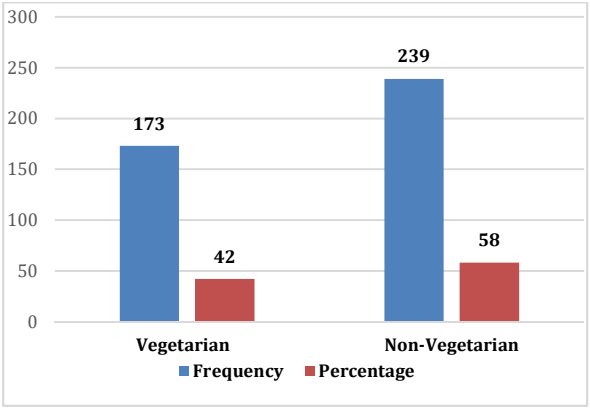

Figure 4: Incidence of caries anterior teeth as per diet (n=412)

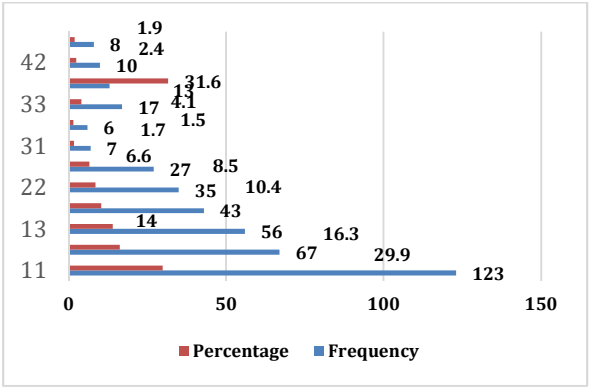

Figure 5: Prevalence of caries in individual teeth (n=412)

DISCUSSION

The current study was designed to determine caries patterns and rates on the surface of individual tooth. As a result, examinations were limited to patients who came for caries treatment. Tooth or tooth surface decay were recorded on charts when cavitation was visible for both age and gender. The current study found that maxillary molars were the most likely to be caries teeth. Caries is significantly common in maxillary teeth compared to the mandibular teeth. Most of occlusal surface fissures in molars show

early signs of caries [12]. The current study's findings agreed with those of Kitasako's study [13]. They discovered that occlusal caries outnumbers other types and improved the fastest and to the greatest extent in molars [14]. Teixeira et al. [15] used two national surveys to compare school-aged children dental caries attack patterns. Caries attack on first molar maxillary ocular surfaces was more prevalent followed by second molars. In contrast to the major dentition, the permanent dentition high caries rates were restricted to molar pit and fissure surfaces [16].

Oral disease, particularly dental caries and periodontitis is a widespread problem in many populations, with significant biologic, physical, economic, social, and psychological consequences. Not only is dental caries distinct in terms of pathologic mechanism. Other social and economic aspects are also worth mentioning. The severity of disease usually worsens as living standards improve. Dental caries is one of the most common and expensive diseases in developed countries [17].

The distribution of anterior carious teeth in different age groups was also determined. The age group of those between 31 and 40 years old had the highest prevalence of carious anterior teeth among the 1276 patients studied. Using the chi square test, the difference between age groups was found to be significant. The p value is 0.0154, which is less than 0.05, indicating that the result is statistically significant. Another study conducted found similar results [18, 19].

A strong correlation was found between diet type (vegetarian vs. non-vegetarian) and caries, which is consistent with Yan et al findings [20]. It is most likely due to increased consumption of fluoride-rich sea food, which may have resulted in a lower caries prevalence in the non-vegetarian population. Furthermore, it is well established that the greater the acid exposure of hard dental tissue, the greater the caries [21]. Saliva is responsible for neutralizing acid produced by microorganisms acting on sugar substrates, but when fermentable carbohydrate is not present in the saliva, putrefaction replaces fermentation, alkalinity replaces acidity, and no decalcification is usually observed [22, 23]. Putrefaction is caused by protein consumption, so it is possible that people who eat a lot of protein-rich foods instead of sugar will have less acid in their mouth and will be more protected from dental caries. It is possible that therefore there are fewer cases among non-vegetarian (mixed diet) people.

The current study found that increasing the frequency of brushing resulted in a decrease in caries. As a result, it can be deduced that better oral hygiene habits lead to a decrease in the prevalence of caries, as reported in Wang et al study [24]. In our study, a significant association was found between anterior tooth malalignment and dental caries, which contradicts the findings, who concluded that there is no relationship between malocclusion and dental caries [25].

CONCLUSION

Our study found that the prevalence of carious anterior teeth was 32.25% and Maxillary central incisors were the commonly affected teeth in most cases. A significant association was found among carious anterior teeth, age, location, oral hygiene, diet, and teeth malalignment. But no significant association among carious anterior teeth, occupation, and gender.

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