



Prevalence and Treatment of Periodontitis, Dental Caries and Malocclusion in a Rural Population

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ABSTRACT:

Background: This study was conducted to assess the Prevalence and treatment of periodontitis, dental caries and malocclusion in a rural population.

Material and methods: The study comprised of 90 subjects. Consent from all the subjects to participate in the study was recorded. All the subjects underwent oral examination. The subjects were aged from 20-40 years. The mean of the subjects was 28.6 years. This examination was carried out in order to assess the prevalence of dental diseases as well as to cure them. Statistical analysis was conducted using SPSS software.

Results: It was found that 30 subjects had periodontitis, 30 subjects showed dental caries while in remaining 30, malocclusion was evident. Hence, these subjects were divided into 3 groups of 30 subjects each. In this study, there were 56 males and 34 females. There were 21, 12 and 23 males in group 1, 2 and 3, respectively. There were 9, 18 and 7 females in group 1, 2 and 3, respectively. Mild periodontitis was evident in 5 subjects while 10 and 15 subjects showed moderate and severe periodontitis, respectively. The most prevalent kind of malocclusion was Angle class II evident in 23 subjects. While there were only 4 and 3 cases of class I and class III malocclusion, respectively. The subjects with mild periodontitis were instructed to rinse their mouth with warm salt water 3-5 times per day for 3 days. The subjects with moderate periodontitis were treated with scaling and root planning. The subjects with severe periodontitis were planned for flap surgery. The subjects with dental caries were treated with root canal treatment followed by placement of stainless-steel crown. The most common malocclusion in this study was Angle class II malocclusion evident in 23 subjects. In 11 subjects, activator was given to treat class II malocclusion, 7 subjects received Twin Block appliance and the remaining 5 subjects received Jasper Jumper appliance.



Conclusion: There was equal prevalence of periodontitis, dental caries and malocclusion in this study. The most common periodontitis was of severe kind. The most common malocclusion was Angle class II malocclusion. Periodontitis was treated with flap surgery, dental caries was treated with root canal treatment followed by placement of stainless-steel crown and class II malocclusion was treated with myofunctional appliances like activator, twin block appliance and jasper jumper.

Introduction

Periodontitis is defined as an inflammatory disease of supporting tissues of teeth caused by specific microorganisms or groups of specific microorganisms, resulting in progressive destruction of the periodontal ligament and alveolar bone with periodontal pocket formation, gingival recession or both.¹

Periodontal disease is a complex infectious disease resulting from interplay of bacterial infection and host response to bacterial challenge, and the disease is modified by environmental, acquired risk factors and genetic susceptibility. Dental plaque represents a classic example of both a biofilm and a microbial community, in that it displays emergent properties, i.e., plaque displays properties that are more than the sum of its constituent members,² and microbial communities are ubiquitous in nature and usually exist attached to a surface as a spatially organized biofilm. Recent studies suggest that the environmental heterogeneity generated within biofilms promotes accelerated genotypic and phenotypic diversity that provides a form of “biological insurance” that can safeguard the “microbial community” in the face of adverse conditions, such as those faced by pathogens in the host.²

Dental caries is a biofilm-mediated, sugar-driven, multifactorial, dynamic disease that results in the phasic demineralization and remineralization of dental hard tissues. Caries can occur throughout life, both in primary and permanent dentitions, and can damage the tooth crown and, in later life, exposed root surfaces. The balance between pathological and protective factors influences the initiation and progression of caries.

This interplay between factors underpins the classification of individuals and groups into caries risk categories, allowing an increasingly tailored approach to care. Dental caries is an unevenly distributed, preventable disease with considerable economic and quality-of-life burdens. The daily use of fluoride

toothpaste is seen as the main reason for the overall decline of caries worldwide over recent decades.³

Angle introduced his famous classification of malocclusion in 1899.⁴ Now the World Health Organization estimates malocclusions as the third most prevalent oral health problem, following dental caries and periodontal diseases.⁵

Many etiological factors for malocclusion have been proposed. Genetic, environmental, and ethnic factors are the major contributors in this context. Certain types of malocclusion, such as Class III relationship, run in families, which gives a strong relation between genetics and malocclusion. Likewise is the ethnic factor, where the bimaxillary protrusion,

for example, affects the African origin more frequently than other ethnicities. On the other hand, functional adaptation to environmental factors affects the surrounding structures including dentitions, bone, and soft tissue, and ultimately resulting in different malocclusion problems. Thus, malocclusion could be considered as a multifactorial problem with no specific cause so far.⁶

Hence, this study was conducted to assess the Prevalence and treatment of periodontitis, dental caries and malocclusion in a known population.

Material and methods

The study comprised of 90 subjects. Consent from all the subjects to participate in the study was recorded. All the subjects underwent oral examination. The subjects were aged from 20-40 years. The mean of the subjects was 28.6 years. This examination was carried out in order to assess the prevalence of dental diseases as well as to cure them. The subjects were then divided into groups based on the dental disease they showed. Statistical analysis was conducted using SPSS software.



Results

Table 1: Prevalence of the diseases.

Groups	Number of subjects
Group 1 (Periodontitis)	30
Group 2 (Dental Caries)	30
Group 3 (Malocclusion)	30
Total	90

It was found that 30 subjects had periodontitis, 30 subjects showed dental caries while in remaining 30, malocclusion was evident. Hence, these subjects were divided into 3 groups of 30 subjects each.

Table 2: Gender-wise distribution of subjects.

Gender	Group 1	Group 2	Group 3
Males	21	12	23
Females	09	18	07
Total	30	30	30

In this study, there were 56 males and 34 females. There were 21, 12 and 23 males in group 1, 2 and 3, respectively. There were 9, 18 and 7 females in group 1, 2 and 3, respectively.

Table 3: Severity of periodontitis

Severity of periodontitis	Number of subjects
Mild	05
Moderate	10
Severe	15
Total	30

Mild periodontitis was evident in 5 subjects while 10 and 15 subjects showed moderate and severe periodontitis, respectively.

Table 4: Types of malocclusion

Type	Number of subjects
Angle class I	04
Angle class II	23
Angle class III	03

Total	30
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The most prevalent kind of malocclusion was Angle class II evident in 23 subjects. While there were only 4 and 3 cases of class I and class III malocclusion, respectively.

Table 5: Treatment of the diseases.

Disease	Treatment
Severe periodontitis	Flap surgery
Dental caries	RCT followed by crown placement
Class II malocclusion	Myofunctional therapy

The subjects with mild periodontitis were instructed to rinse their mouth with warm salt water 3-5 times per day for 3 days. The subjects with moderate periodontitis were treated with scaling and root planning. The subjects with severe periodontitis were planned for flap surgery.



Figure 1: Flap surgery

The subjects with dental caries were treated with root canal treatment followed by placement of stainless-steel crown. The most common malocclusion in this study was Angle class II malocclusion evident in 23 subjects. In 11 subjects, activator was given to treat class II malocclusion, 7 subjects received Twin Block appliance and the remaining 5 subjects received Jasper Jumper appliance.

Discussion

Dental caries is a major oral health problem affecting 2.43 billion people (35.3% of the population) worldwide in the year 2010.⁷ A high burden of dental caries was evident among children in Saudi Arabia with an



estimated prevalence of approximately 80%⁸; other high-risk areas include Latin America, Middle East, and South Asia.⁹ The World Health Organization (WHO) emphasizes the need to reduce global burden of dental caries in attaining optimal health. Consequently, in the year 2003, WHO and Fédération Dentaire Internationale (FDI) World Dental Federation set global goals for oral health in 2020 to guide planners and policy makers to improve the status of oral health in their populations.¹⁰

Chronic diseases globally have exhibited a steady rise, sparing no region or socioeconomic class. Periodontal disease, a component of this rising global burden essentially shares similar risk factors with other chronic diseases.¹¹ However, unlike these, periodontal health seldom garners any attention. Quantifying periodontal disease in a meaningful manner, hence, is critical to its prioritization. The National Oral Health Survey of India (2002), provides a comprehensive national data on periodontal disease prevalence.¹²

The WHO considers malocclusion one of the most important oral health problem, after caries and periodontal disease.¹³ Its prevalence is highly variable and is estimated to be between 39% and 93% in children and adolescents.¹⁴⁻¹⁶ This prevalence range is very wide and heterogeneous. This inhomogeneity may be due to ethnic and age differences of patients considered in studies, assessing the prevalence of malocclusion.^{17,18}

Hence, this study was conducted to assess the Prevalence and treatment of periodontitis, dental caries and malocclusion in a known population.

In this study, it was found that 30 subjects had periodontitis, 30 subjects showed dental caries while in remaining 30, malocclusion was evident. Hence, these subjects were divided into 3 groups of 30 subjects each. In this study, there were 56 males and 34 females. There were 21, 12 and 23 males in group 1, 2 and 3, respectively. There were 9, 18 and 7 females in group 1, 2 and 3, respectively. Mild periodontitis was evident in 5 subjects while 10 and 15 subjects showed moderate and severe periodontitis, respectively. The most prevalent kind of malocclusion was Angle class II evident in 23 subjects. While there were only 4 and 3 cases of class I and class III malocclusion, respectively. The subjects with mild periodontitis were instructed to rinse their mouth with warm salt water 3-5 times per day for 3 days. The subjects with moderate periodontitis were treated

with scaling and root planning. The subjects with severe periodontitis were planned for flap surgery. The subjects with dental caries were treated with root canal treatment followed by placement of stainless-steel crown. The most common malocclusion in this study was Angle class II malocclusion evident in 23 subjects. In 11 subjects, activator was given to treat class II malocclusion, 7 subjects received Twin Block appliance and the remaining 5 subjects received Jasper Jumper appliance.

Alhabdan YA et al¹⁹ assessed the prevalence of dental caries and identifying key associated factors in four major risk domains, including socioeconomic factors, child oral health behavior and practices, child feeding practices, and dietary habits among primary school children in Saudi Arabia. A cross-sectional study design was used to recruit 578 male Saudi primary school children, aged 6-8 years, from 12 primary schools in five different regions of Riyadh. Children were clinically screened to detect carious lesions in primary teeth according to World Health Organization's criteria. Structured self-administered questionnaire was used to collect information on social and individual factors from the parents. The odds ratios and 95% confidence intervals of associated factors for dental caries were computed using logistic regression models; key factors were identified by systematic selection process that accounted for multicollinearity and bias correction. Dental caries was prevalent among children (83%, 95% confidence interval 79.7-86.0%). Individual factors, including irregular brushing, late adoption of brushing habit, consulting dentist for symptomatic treatment, lack of breast feeding, sleeping with a bottle in mouth, habit of snacking between meals, low consumption of fruits, and frequent consumption of soft drinks and flavored milk, were predominantly associated with dental caries in children, instead of socioeconomic factors ($p < 0.05$, adjusted R-square 80%). Dental caries were prevalent in school children, and individual factors were predominantly associated with the disease.

Varma SV et al²⁰ identified the prevalence of chronic periodontitis and chronic stress as well as a comparative evaluation of clinical, demographic, and psychoanalytical parameters among the South Indian population. A total of 500 subjects between the ages of 30 and 60 were chosen from the Trivandrum district, Kerala, using multistage random sampling. Subjects were evaluated based on psychoanalytical parameters as



well as periodontal examination. Psychoanalytical parameters were measured by the questionnaire method using the perceived stress scale. Periodontal parameters examined were the probing depth, clinical attachment loss, bleeding on probing, simplified oral hygiene index, and community periodontal index (loss of attachment). Categorical and quantitative variables were expressed as frequency (percentage) and mean \pm SD respectively. Logistic regression analysis was used to analyze the association between the periodontal variables and psychoanalytical variables. All the statistical analysis was performed using IBM Statistical Package for Social Sciences (SPSS) Statistics for Windows (IBM Corp., USA). A total of 500 subjects, of whom 308 (61.6%) were female and 192 (38.1%) were male, participated in this study. The overall prevalence of periodontitis among all the subjects was found to be 42.4%, and the proportion of periodontitis among the stressed participants was found to be 46.2%, which is 10% higher compared to the non-stressed (36.1%) participants. Their study showed an increased frequency of periodontitis among the stressed subjects as compared to the non-stressed subjects. These findings suggest that there is a positive association between chronic stress and chronic periodontitis, but further prospective studies are required to establish the extent of the effect chronic stress has on chronic periodontitis and vice versa.

Tak M et al²¹ assessed the prevalence of malocclusion and orthodontic treatment needs among 12-15 years old school children of Udaipur, India. A cross-sectional descriptive survey was conducted among 887 subjects aged 12-15 years. The prevalence of malocclusion and orthodontic treatment needs was assessed using dental aesthetic index (World Health Organization, 1997). General information on demographic data was also recorded. Chi-square test, analysis of variance and Scheffe's test were employed for statistical analysis. Malocclusion and orthodontic treatment need was reported among 33.3% of the study subjects. A significant age and gender difference depicting preponderance among younger age group and a male proclivity was experiential. A significant improvement in anterior crowding and largest anterior maxillary irregularity with age was documented. Males had a significantly higher prevalence of anterior crowding, midline diastema and largest anterior maxillary irregularity than females. The prevalence of

malocclusion and orthodontic treatment needs among school children of Udaipur city, Rajasthan, India was found to be 33.3%. A significant age and gender difference was observed in prevalence of malocclusion, crowding and largest anterior maxillary irregularity. Midline diastema showed a significant gender difference. The baseline information outlined in the present study can be appropriately utilized for the future planning to meet the orthodontic treatment need among the population.

Conclusion

There was equal prevalence of periodontitis, dental caries and malocclusion in this study. The most common periodontitis was of severe kind. The most common malocclusion was Angle class II malocclusion. Periodontitis was treated with flap surgery, dental caries was treated with root canal treatment followed by placement of stainless-steel crown and class II malocclusion was treated with myofunctional appliances like activator, twin block appliance and jasper jumper.

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