

Prevalence Of Clinically Healthy Gingiva and its Relationship to Oral Hygiene Status - A Retrospective Cohort Study

Research Article

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Abstract

Diagnosis of clinically healthy gingiva is based on clinical features like colour, contour consistency, size and shape of gingiva and absence of bleeding on probing. The associated oral hygiene can be good, fair or poor. In this study an attempt has been made to estimate the relationship of clinically healthy gingiva and oral hygiene status. This was a retrospective study and the data was obtained from the past case records of patients who visited a private Dental College during the period of June 2019 to March 2020. The study was done in a university setting. Patients with clinically healthy gingiva were included for the study. All the necessary information was collected and entered in Microsoft Excel spreadsheet and subsequently transferred to SPSS version 23.0 for statistical analysis. Chi square tests were employed to find the association between different variables and $p < 5\%$ was considered statistically significant. Out of 567 individuals 55.21% were males and 44.8% were females. The mean age of males were 28.92 ± 9.1 and for females, 31.13 ± 9.3 . 38.27% of males and 24.51% of females were below 30 years of age, 15.17% of males and 18.52% of females were between 31 to 50 years of age, 1.76% of males and 1.76% of females were above 51 years of age. From the present study it is evident that 31.22% of males and 30.51% of females had good oral hygiene. 39.68% of individuals with good oral hygiene were below 30 years of age. There was a Statistical significant difference in the prevalence of gingival health between good oral hygiene status and fair oral hygiene status ($p=0.002$).

Keywords: Clinically Healthy Gingiva; Fair Oral Hygiene; Good Oral Hygiene.

Introduction

Oral health is defined as "The standard health of the oral and related tissues which enable an individual to eat, speak and socialize without active diseases, discomfort and embarrassment and which contributes to general well being" [1]. It affects the general health and diminished quality of life [2, 3]. Prevention of dental plaque and early treatment is necessary to prevent periodontal disease as it is considered as the second most common oral disease following dental caries.

The diagnostic criteria to assess the gingival health includes the gingival redness, gingival bleeding on probing, probing depth, distance between gingival margin and cemento enamel junction and

clinical attachment level [4]. A healthy gingiva will have a probing depth of less than 3 mm, no pockets, no clinical attachment loss and no gingival redness and bleeding on probing. The new classification of periodontal disease was given recently in the year 2017 and was agreed that bleeding on probing to be the primary parameters to set the threshold for gingivitis. It was accepted that an individual with gingivitis can revert to a healthy gingiva, but an individual with periodontitis will have the disease for life, even after successful therapy, and requires life-long supportive care to prevent recurrence of disease [5].

Periodontal diseases can be broadly classified into gingivitis which affects only marginal gingiva, attached gingiva and interdental papilla, and periodontitis which involves the gingiva, periodontal lig-

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ament, periodontal fibres. It is accepted that periodontal disease begins as gingivitis, which progresses to periodontitis however, not in all individuals [6]. These Oral diseases are important since they may lead to tooth loss and affect the general well being of the individuals [7]. Oral diseases are significantly higher in poor and disadvantaged populations with an increase in developing countries [8].

Professional removal of plaque and calculus have been extensively accepted for prevention for gum diseases [9]. Dental caries and periodontal disease can be prevented by plaque removal and oral hygiene maintenance [10].

Simplified oral hygiene index was developed by John Greene and Vermillion. Oral hygiene is measured using the OHI-s by examination of debris, calculus or stains present on the specific surfaces of the induced teeth. The surfaces examined were, buccal surface of maxillary first permanent molars and right central incisor and lingual surface of mandibular first permanent molars and left central incisor. In the absence of the incisor, adjacent incisors were examined and in the absence of firsts permanent molars, adjacent second molars were examined. Debris score and calculus scores are calculated separately. The scores for oral debris are given accordingly: 0 (no debris or stain present) 1 (Debris covering <1/3 of the tooth surface or extrinsic stain without debris), 2 (Debris covering between 1/3 and 2/3 of the tooth surfaces), 3 (Debris covering >2/3 of the tooth surfaces). Oral calculus scores are given accordingly: 0 (No calculus present), 1 (Supragingival calculus present covering <1/3 of the tooth surface), 2 (Supragingival calculus covering between 1/3 and 2/3 of the tooth surface, or scattered sub gingival calculus), 3 (Supragingival calculus covering >2/3 of the tooth surface, or a continuous heavy band of sub gingival calculus around the teeth). For both the indices, scores for individual teeth are given, summed and divided by the number of teeth examined. Addition of Debris and Calculus score provides OHI-s score [11, 12]. A grade of good (0.0 to 1.2) fair (1.3 to 3.0) or poor (3.0 to 6.0) is given based on the OHI-s score.

There are limited studies on clinically healthy gingiva. The main objectives of this epidemiological study were (i) to assess the gingival status among the population, (ii) to assess the grades of oral hygiene score among individuals with clinically healthy gingiva (iii) to assess the grades of oral hygiene score among different age group of individuals with clinically healthy gingiva.

Materials and Methods

Study Design

This was a retrospective study conducted in a private dental institution. The patient case records were reviewed for the necessary information by a trained examiner. The advantage of conducting the study in an institutional set up provides easy access to patient records. Among patients who have visited the dental clinic of the institution, the case records of 41,339 patients were reviewed out of which 567 were found to have clinically healthy gingiva. A wide age range is selected for the study. The institutional ethical committee provided approval for the study (SDC/SIHEC/2020/DIASDATA/0619-0320).

Inclusion criteria

Patients who had clinically healthy gingiva and Patients from < 30 years to >51 years of age were included in this study.

Exclusion criteria

Incomplete patient data, Duplicate patient data, Patients having gingivitis and Patients with periodontitis were excluded from the study.

Sampling

A total of 567 case records of patients with clinically healthy gingiva were reviewed to find out oral hygiene status, whether they have good fair or poor. The oral hygiene status was obtained using OHI-s index by John Greene and Vermillion. Convenient sampling method was used to select the patients for the study. The data obtained from the case records were cross verified with photographs.

Data collection

All the data after thorough checking for duplicates, incomplete entries and cross verification with photographs were entered in Microsoft excel spread sheet in order to organise the data. The variables obtained from the data included age, gender, oral hygiene status. Here age and gender are the independent variables and the oral hygiene status is the dependent variable.

Statistics

The statistical analysis of the obtained data was performed by the SPSS software version 23.0. The data from the excel spreadsheet was transferred to SPSS software for analysis. Chi square tests were employed in order to find the association between different variables. The p value less than 5% was considered statistically significant. The final results are presented in the form of graphs for further interpretation and discussion.

Results and Discussion

In the present study, out of 41,339 patients only 567 had clinically healthy gingiva which is 1.37%. 0.76% were males and 0.61% were females.

Out of 567 patients 55.21% were males and 44.8% were females. The mean age of males were 28.92 ± 9.1 and for females, 31.13 ± 9.3 .

The distribution of age and gender of individuals with clinically healthy gingiva were studied in that 38.27% of males and 24.51% of females were below 30 years of age, 15.17% of males and 18.52% of females were between 31 to 50 years of age, 1.76% of males and 1.76% of females were above 51 years of age. Chi-square test was done [p value 0.002 (< 0.05)] and was found to be statistically significant. Among individuals with clinically healthy gingiva, the majority of the males and females were below 30 years (figure 1).

The distribution of age and oral hygiene status of individuals with

clinically healthy gingiva were studied in that individuals below 30 years of age had 39.68% of good oral hygiene and 23.10% of fair oral hygiene. Individuals between 31 to 50 years of age had 19.58% of good oral hygiene and 14.11% of fair oral hygiene. Individuals above 51 years of age had 2.47% of good oral hygiene and 1.06% of fair oral hygiene. Chi- square test was done [p value 0.375 (> 0.05)] and was found to be statistically not significant. Among individuals with clinically healthy gingiva, majority of the individuals below 30 years have good oral hygiene. No one with clinically healthy gingiva had poor oral hygiene (figure 2).

The distribution of gender and oral hygiene status of individuals with clinically healthy gingiva were studied in that 31.22% of males had good oral hygiene and 23.99% of males had fair oral hygiene. 30.51% of females had good oral hygiene and 14.29% of females had fair oral hygiene. Chi- square test was done [p value 0.005 (< 0.05)] and was found to be statistically significant. Among individuals with clinically healthy gingiva, majority of the males and females have good oral hygiene. There were no individuals with poor oral hygiene (figure 3).

Individuals having clinically healthy gingiva is a good sign. Good oral hygiene status increases positive self-image, self confidence and also increases quality of life. Unfortunately due to lifestyle changes and poor knowledge, individuals with clinically healthy gingiva are very less.

Study done in private college in Riyadh city showed that gingivitis prevalence was 100% between 18 and 10 years [13] A study by Broadben JM et al shows that periodontal diseases ranges from 55% adolescent to 80% in adults [14] Only minor proportion of Indian school going children have good oral hygiene [15].

There are no relevant studies related to association of clinically healthy gingiva and oral hygiene status as such.

The current study shows that younger individuals have higher chances of clinically healthy gingiva. This shows that as age increases, patients eventually might get gingivitis or periodontitis if oral hygiene is not maintained.

Figure 1. Shows association between age and gender of individuals with clinically healthy gingiva, X axis shows age, Y axis shows number of patients with clinically healthy gingiva, Chi- square test was done [p value 0.002 (< 0.05)] and was found to be statistically significant. Among individuals with clinically healthy gingiva, majority of the males (violet) and females (purple) were below 30 years.

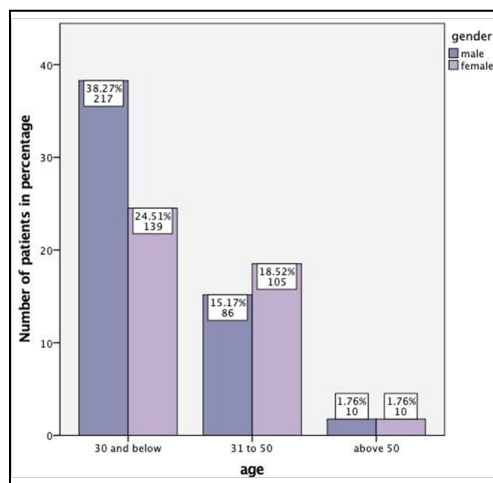


Figure 2. Shows association between age and oral hygiene status of individuals with clinically healthy gingiva. X axis shows age, Y axis shows number of patients with clinically healthy gingiva, Chi- square test was done [p value 0.375 (> 0.05)] and was found to be statistically not significant. Among individuals with clinically healthy gingiva, majority of the individuals below 30 years have good oral hygiene.

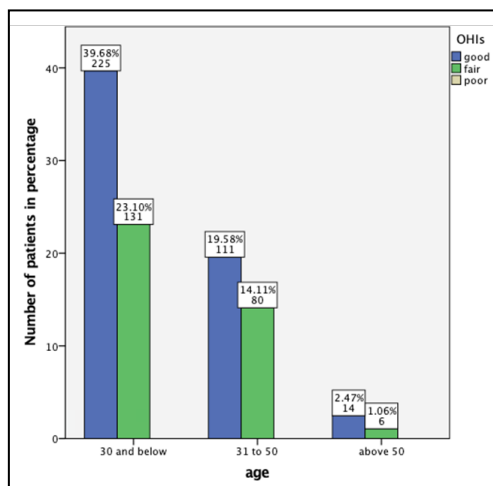
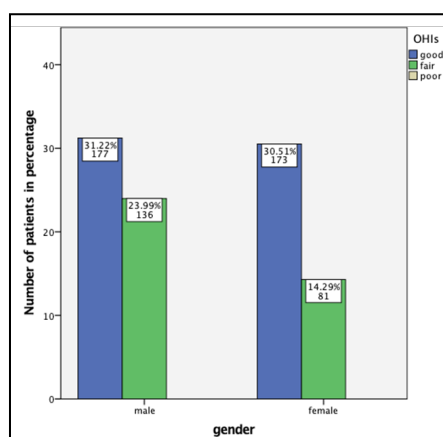


Figure 3. Shows association between gender and oral hygiene status of individuals with clinically healthy gingiva. X axis shows gender, Y axis shows number of patients with clinically healthy gingiva. Chi-square test was done [p value 0.005 (< 0.05)] and was found to be statistically significant. Among individuals with clinically healthy gingiva, majority of the males and females have good oral hygiene.



Zhang et al demonstrated that higher group age had significantly high gingival inflammation compared to other younger groups [16] this is consistent without study which shows that only 3.5% were above 50 years with clinically healthy gingiva.

Even though our study includes clinically healthy gingiva individuals, 38.3% had fair oral hygiene. This shows that the individuals might have 1/3rd of the tooth surface covered by debris or calculus. It is well documented that the presence of plaque deposits is closely related with the gingival inflammation [17] even though the individuals have clinically healthy gingiva they might acquire gingivitis if the plaque and calculus are not removed and might progress to periodontitis.

Periodontitis is a multifactorial disease with primary etiological agents being plaque and microflora. Research has also stated that periodontal microflora is similar to that found in atheromatous plaque [18]. The levels of TNF, endothelins and interleukin 21 vary in chronic and aggressive periodontitis [19-22]. Cytokines also play an important role in the pathogenesis and progression of periodontitis. Periodontal disease can be a risk factor of COPD and cardiac disease hence its important to manage the periodontal and osseous defects effectively [23-25]. Platelet rich fibrin and growth factors provide advantage over other forms of treatments [26, 27]. Researchers had attempted various regenerative methods such as PRF, growth factors and even stem cells in managements of chronic and aggressive periodontitis [28-30]. Antimicrobial therapy for treating aggressive periodontitis provided added advantages over the basic treatment modalities followed for chronic or aggressive periodontitis [31]. Herbs were also used as antimicrobial agents and its effectiveness in various mouthwash had been tested [32].

Limitations of this study include small sample size. Since it was a retrospective study, possible manual errors could have occurred during data entry by residents during patients examination, subjective bias was another limitation of this study. Future study can be done with a wide range of population.

Acknowledgement and Declarations

The authors are thankful to the dental institute for providing a platform to perform the research study. The authors declare no conflicts of interest.

Conclusion

Within the limitations of the present study, we can conclude that the prevalence of clinically healthy gingiva of the individuals who visited the private dental college was found to be only 1.37%. Of which 0.76% were males and 0.61% were females.

61.7% individuals with clinically healthy gingiva have good oral hygiene and 38.3% had fair oral hygiene. Among the individuals with clinically healthy gingiva, most of the individuals with good oral hygiene were below 30 years (39.68%) and most were males (31.22 %). Statistical significance was found between the association of age and gender of the individuals with clinically healthy gingiva and between gender and oral hygiene score of individuals with clinically healthy gingiva. Clinically healthy gingiva is seen more in younger individuals.

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