Correlation Of Chronic Periodontitis With Oral Hygiene Status: A Cross-Sectional Study

Research Article

Thanish Ahamed. S[1], Jayakumar. ND[2*], Mebin George Mathew[3]

[1] Saveetha Dental college and Hospitals, Saveetha Institute of medical and Technical Sciences, Saveetha University, Chennai, India.
[2] Dean of Faculty, Professor and Head, Department of Periodontics, Saveetha Dental College and hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India.
[3] Senior Lecturer, Department of Pedodontics, Saveetha Dental College and hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India.

Abstract

Periodontitis refers to chronic inflammatory disease affecting the supporting tissues of the teeth. It is a multifactorial disease. However, the primary etiology of this disease is bacterial plaque. Dental plaque accumulation and inadequate personal oral hygiene are major risk factors of periodontitis. The aim of the study was to correlate chronic periodontitis with oral hygiene status. The present retrospective study was conducted among 900 chronic periodontitis who reported to a private institution from June 2019 to March 2020. Data regarding oral hygiene status was collected from clinical records. Data were analysed to find out whether there was any significant difference in the oral hygiene status of the chronic periodontitis patients with respect to different age groups and gender, using Chi-square test (SPSS software). There was a statistical significant difference in the association between oral hygiene status and different age groups (p value-0.00). Also, there was a statistical significant difference in the association between oral hygiene status and gender (p value-0.00). The present study showed that the majority of the chronic periodontitis patients had poor oral hygiene with male predilection.

Keywords: Dental Plaque; Gingivitis; Oral Hygiene; Periodontitis; Risk Factor.

Introduction

Periodontitis is the most common oral disease worldwide. There are two common diseases affecting the periodontium. The first is gingivitis, which is defined as inflammation of the gingiva in which the connective tissue attachment to the tooth remains at its original level. The disease is limited to the soft-tissue compartment of the gingival epithelium and connective tissue. The second is periodontitis, which is an inflammation of the supporting tissues of the teeth with progressive attachment loss and bone destruction. [1] The most common forms of periodontitis are chronic periodontitis, aggressive periodontitis, periodontitis as a manifestation of systemic diseases. [2]

Periodontitis is a multifactorial disease, with primary etiology being plaque microflora. The pathogenesis of periodontal diseases is mediated by the inflammatory response to bacteria in the dental biofilm. Research has also shown that periodontal microflora is similar to that found in atheromatous plaques. [3] Cytokines play an important role in the pathogenesis of periodontitis and the levels of tumor necrosis factor-α, interleukin-1 and endothelin varies in chronic and aggressive periodontitis. [4-7] Also, periodontal disease can be a risk factor for cardiac disease and chronic obstructive pulmonary disease. [3, 8] There are various regenerative treatment modalities available to successfully treat the osseous defects due to periodontal disease. Researchers have attempted various regenerative methods like bone grafts, platelet rich fibrin, growth factors, stem cells to salvage the destruction of periodontal tissues in chronic as well as aggressive forms of periodontitis. [9-15]

The treatment modalities for chronic and aggressive periodontitis though basically remains the same, antimicrobial therapy has provided added advantage in treating aggressive periodontitis cases.

Thanish Ahamed. S, Jayakumar. ND, Mebin George Mathew. Correlation Of Chronic Periodontitis With Oral Hygiene Status: A Cross-Sectional Study. *Int J Dentistry Oral Sci*. 2021;8(7):2911-2915.

2911

[16] Herbs have been used as antimicrobial agents in treating periodontal diseases. Effectiveness of various herbal mouth rinses have been tested in different periodontal diseases. [17])

Dental plaque accumulation and inadequate personal oral hygiene are known major risk factors of periodontitis. The accumulation of dental plaque and calculus is usually caused by improper tooth brushing techniques, failure to carry out interdental cleaning and irregular dental visits. This accumulation predictably results in gingival inflammation. Persistent gingivitis is a key risk predictor for the breakdown of periodontal attachment. [18]

Oral hygiene is the level of oral cleanliness of an individual and is assessed based on the accumulation of hard and soft deposits on the surfaces of teeth, which are the etiological factors of periodontal disease. The simplified oral hygiene index (OHI-S) developed by Greene and Vermillion (1964) is a simple, standard and acceptable method of assessing oral hygiene. [19] Assessment of oral hygiene of individuals reasonably reflects their gingival and periodontal health.

Although poor oral hygiene is a well accepted and important risk factor for periodontitis, literature search reveals only few studies assessing the magnitude of association between oral hygiene and periodontitis.Previously our team has a rich experience in working on various research projects across multiple disciplines [20-34].

Therefore, to address this lacunae this research was undertaken to correlate chronic periodontitis with oral hygiene status.

The objective was (i) to correlate chronic periodontitis with oral hygiene status (good/fair/poor); (ii) to assess the association of oral hygiene status of chronic periodontitis patients among different age groups; (iii) to assess the association of oral hygiene status of chronic periodontitis patients among males and females.

Materials And Methods

The present retrospective study was conducted among chronic periodontitis patients who reported to a private institution from June 2019 to March 2020. The study setting was a university setting. Ethical approval was obtained from the Institutional ethical committee (SDC/SIHEC/DIASDATA/ 0619-0320). Cross verification was done with an external examiner to avoid any missing data values. Sampling bias was minimised by including all available data.

Case sheets of patients visiting a private dental institution were reviewed and 900 patients diagnosed with chronic periodontitis were included in the study. Patients diagnosed with clinically healthy gingiva and gingivitis were excluded from the study. Incomplete data were excluded from this study. Independent variables were age, gender and the dependent variable was oral hygiene status. The oral hygiene status of the selected study participants were assessed based on simplified oral hygiene index (OHI-S) developed by Greene and Vermillion.

Data were analysed to find out whether there was any significant difference in the oral hygiene status of the chronic periodontitis patients with respect to different age groups and gender, using Chi-square test (SPSS software; Version 23). The level for a statistical significance was set at $p<0.05$.

Results And Discussion

In the present study, table 1 showed that among 900 chronic periodontitis patients, 22 patients (2.4%) had good oral hygiene status, 196 patients (21.8%) had fair oral hygiene status, 682 patients (75.8%) had poor oral hygiene status. Majority of the patients had poor oral hygiene status. This finding is in accordance with previous studies by Lertpimonchai A et al [35] and Torrungruang K et al.(36), where poor oral hygiene status was predominantly seen in chronic periodontitis patients.

The study population was categorized based on their age as follows: 15-30 years, 31-45 years, 46-60 years and 61-75 years. Table 2 showed distribution of chronic periodontitis patients based on their oral hygiene status among different age groups. Among 15-

Table 1: Table showing distribution of chronic periodontitis patients based on the oral hygiene status.

OHI-S Interpretation			Total
Good	**Fair**	**Poor**	
(0.0 to 1.2)	(1.3 to 3.0)	(3.1 to 6.0)	
22	196	682	900
-2.40%	-21.80%	-75.80%	

Table 2: Table depicts the distribution of chronic periodontitis patients based on their oral hygiene status among different age groups.

Age Groups (years)	OHI-S Interpretation			
	Good (0.0 to 1.2)	**Fair (1.3 to 3.0)**	**Poor (3.1 to 6.0)**	**Total**
15-30	10 (1.11%)	23 (2.56%)	70 (7.78%)	103 (11.45%)
31-45	6 (0.67%)	54 (6.00%)	179 (19.89%)	239 (26.56%)
46-60	3 (0.33%)	70 (7.78%)	213 (23.67%)	286 (31.78%)
61-75	3 (0.33%)	49 (5.44%)	220 (24.44%)	272 (30.21%)
	22 (2.44%)	196 (21.78%)	682 (75.78%)	900

Thanish Ahamed. S, Jayakumar. ND, Mebin George Mathew. Correlation Of Chronic Periodontitis With Oral Hygiene Status: A Cross-Sectional Study. *Int J Dentistry Oral Sci.* 2021;8(7):2911-2915.

Table 3. Table depicts the distribution of chronic periodontitis patients based on their oral hygiene status among females and males.

Gender	OHI-S Interpretation			
	Good (0.0 to 1.2)	Fair (1.3 to 3.0)	Poor (3.1 to 6.0)	Total
Female	13 (1.44%)	125 (13.89%)	282 (31.33%)	420 (11.45%)
Male	9 (1.00%)	71 (7.89%)	400 (44.44%)	480 (26.56%)
	22 (2.44%)	196 (21.78%)	682 (75.78%)	900

Figure 1. Bar chart depicts the association of oral hygiene status among different age groups. X-axis denotes age groups. Y-axis denotes the number of patients. Chi-square test was done and was found to be statistically significant (Pearson chi square, p value- 0.000;(<0.05). Good oral hygiene status was commonly observed within the age group of 15-30 years. From this graph it can be inferred that fair oral hygiene status was commonly observed within the age group of 46-60 years. Poor oral hygiene status was commonly observed within the age group of 61-75 years.
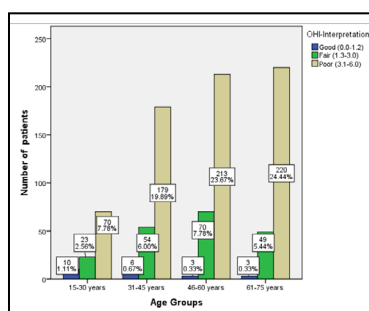

Figure 2. Bar chart depicts the association of OHI-Interpretation in male and female patients. X-axis denotes gender. Y-axis denotes the number of patients. Chi-square test was done and was found to be statistically significant (Pearson chi square, p value- 0.000;(<0.05). From this graph it can be inferred that good and fair oral hygiene status was commonly observed among females. Poor oral hygiene status was commonly observed among males.
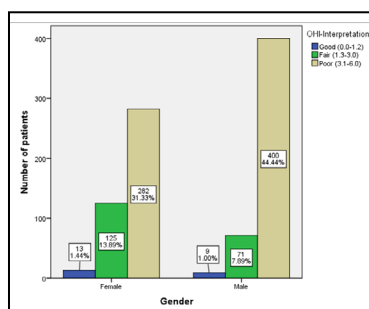
30 years, 10 patients (1.11%) had good oral hygiene status, 23 patients (2.56%) had good oral hygiene status and 70 patients (7.78%) had good oral hygiene status. Among 31-45 years, 6 patients (0.67%) had good oral hygiene status, 54 patients (6.00%) had good oral hygiene status and 179 patients (19.89%) had good oral hygiene status. Among 46-60 years, 3 patients (0.33%) had good oral hygiene status, 70 patients (7.78%) had good oral hygiene status and 213 patients (23.67%) had good oral hygiene status. Among 61-75 years, 3 patients (0.33%) had good oral hygiene status, 49 patients (5.44%) had good oral hygiene status and 220 patients (24.44%) had good oral hygiene status.

In the present study, poor oral hygiene status was commonly observed within the age group of 61-75 years. In a study by Lolita YM et al, [37] reported that the oral hygiene of the chronic periodontitis patients within the age range of 65–74 years were generally poor. Ngatia EM et al reported that poor oral hygiene status was observed predominantly among patients above the age of 60 years. [38]

Figure 1 showed that the association of oral hygiene status among

different age groups. Good oral hygiene status was commonly observed within the age group of 15-30 years. Fair oral hygiene status was commonly observed within the age group of 46-60 years. Poor oral hygiene status was commonly observed within the age group of 61-75 years. Chi-square test was done, p value was 0.00. There was a statistical significant difference in the association of oral hygiene status among different age groups.

Table 3 showed the distribution of chronic periodontitis patients based on their oral hygiene status among females and males. Among 900 chronic periodontitis patients, there were 420 females and 480 males. Among 420 females, 13 (1.44%) had good oral hygiene status, 125 (13.89%) had good oral hygiene status and 282 (31.33%) had good oral hygiene status. Among 480 males, 9 (1.00%) had good oral hygiene status, 71 (7.89%) had good oral hygiene status and 400 (44.44%) had good oral hygiene status. Good and fair oral hygiene status was commonly observed among females. Poor oral hygiene status was commonly observed among males. In a study by Homata EM et al, [39] confirmed that women have better oral hygiene compared to men. Also, Sanadi RM et al, in a study suggested that females had better oral health when

Thanish Ahamed. S, Jayakumar. ND, Mebin George Mathew. Correlation Of Chronic Periodontitis With Oral Hygiene Status: A Cross-Sectional Study. *Int J Dentistry Oral Sci*. 2021;8(7):2911-2915.

2913

compared to males. [40]

Figure 2 showed that the association of oral hygiene status among males and females. Poor oral hygiene status was commonly observed among males when compared to females. Chi-square test was done, p value was 0.00. There was a statistical significant difference in the association of oral hygiene status among males and females.

The finding from the present study adds to the consensus of the previous studies. However, the study has some limitations like limited sample size and other confounding factors like smoking, systemic diseases, stress, genetic factors which contribute to periodontitis were not considered in the present study. Therefore, extensive research is required to assess the correlation of periodontitis with oral hygiene status by considering all the possible risk factors associated with periodontitis and among the larger population.Our institution is passionate about high quality evidence based research and has excelled in various fields [41-51].

Conclusion

From the present study, we can conclude that poor oral hygiene status was predominantly seen in chronic periodontitis patients with male predilection. There was a statistical significant difference in the association between oral hygiene status and different age groups. Also, there was a statistical significant difference in the association between oral hygiene status and gender.

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Thanish Ahamed. S, Jayakumar. ND, Mebin George Mathew. Correlation Of Chronic Periodontitis With Oral Hygiene Status: A Cross-Sectional Study. *Int J Dentistry Oral Sci.* 2021;8(7):2911-2915.

2914

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2915