

## Gender Differences In Periodontal Status And Oral Hygiene Of Systemically Healthy And Compromised Individuals

Research Article

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### Abstract

**Introduction:** Bacterial infections of the tissues that surround the teeth are more common which includes gingivitis and periodontitis. Gingivitis may advance to periodontitis, a condition in which connective tissue attachment and alveolar bone are destroyed, resulting in tooth loss.

**Aim:** This study aims to assess the gender differences in periodontal status and oral hygiene in systemically healthy and compromised individuals.

**Materials and Methods:** The present study consisted of 200 outpatients who reported to the Department of Periodontics, Saveetha Dental College and Hospitals, Chennai between December 2020 and January 2021 were enrolled. The patients were categorised based on gender and systemic disease status. Then the oral hygiene index-Simplified (OHI), probing pocket depth (PPD) and clinical attachment loss (CAL) were recorded. Chi-square test was done for data summarization and presentation. The results were considered statistically significant when the p-value was <0.05.

**Results:** Among systemically compromised males, only 1.00% had good oral hygiene, 6.00% had fair and 17.00% had poor oral hygiene. Also among systemically compromised females, 1.0%, 9% and 16.0% had good, fair and poor oral hygiene status. Among systemically compromised males, 4.00% of them had PPD of 1-3mm, 14.00% had PPD of 4-6mm and the rest 6.00% had >6mm. Among systemically compromised females, 9.0% of them had PPD of 1-3mm, 9% of them had PPD of 4-6mm and 5.0% had PPD of >6mm. Among systemically compromised males, 9.00% had a CAL of 4-6mm and 15.00% had CAL greater than 6mm. Among systemically compromised females, 3.0% had CAL of 1-3mm, 12.0% had CAL of 4-6mm and 13.0% had CAL greater than 6mm.

**Conclusion:** The present study suggests that males presented with poor oral hygiene status, greater probing pocket depth and greater clinical attachment loss when compared to females. Also, when systemically compromised and systemically healthy individuals were compared, systemically compromised patients showed poor oral hygiene status, greater probing pocket depth and greater clinical attachment loss.

**Keywords:** Periodontitis; Oral Hygiene; Periodontal Probing Depth; Innovative; Clinical Attachment Loss; Innovative Technique.

### Introduction

Periodontitis is a complex polymicrobial inflammatory disease that affects over 100 million people worldwide and is partly responsible for tooth loss. Periodontitis is a condition in which connective tissue attachment and alveolar bone are destroyed, resulting in tooth loss. The most common symptoms of severe periodontitis

include loss of attachment, alveolar bone and teeth, extending beyond the local level to produce systemic effects, increases local and systemic inflammation[1-6]. Even though the primary aetiology of the periodontal disease is bacterial plaque, the disease is aggravated by various risk factors including age, systemic diseases, gender, genetic factors, smoking, stress, hormones[7-18].

Gender-based heterogeneity in periodontal disease has been wit-

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nessed in the recent past with huge mounting evidence. Gender has been associated with the diverse occurrence of periodontal disease in population studies and generally, males are known to suffer greater from gum disease than females of comparable age. Males usually exhibit poorer oral hygiene compared to females. However, when oral hygiene, socioeconomic status, age, is correlated with gender, males are found to be associated with more severe periodontal disease. Females are more hygiene and esthetics conscious and seek dental treatment more often when compared to males[18-21].

Numerous studies have revealed the association between periodontitis and different systemic diseases such as cardiovascular disorders like atherosclerosis [22], myocardial infarction and stroke [23, 24], diabetes mellitus [25, 26], adverse pregnancy outcomes [15, 27] and respiratory diseases [28, 29]. According to the concept highlighted by Miller as focal infection theory, the periodontal infection may act as a focus of infection for systemic diseases [30, 31]. In periodontitis, due to the virulence nature of periodontal pathogens, the epithelial barrier is breached and thus the bacterial endotoxin enters into the underlying connective tissues and blood vessels, thereby entering the systemic blood circulation. This is considered to be the primary mechanism of periodontitis-related systemic diseases.

Our team has extensive knowledge and research experience that has translated into high-quality publications [32-51]. Literature search reveals studies assessing gender differences in oral hygiene and periodontal status of systemically healthy and compromised individuals were minimal. In this context, the present study was undertaken to assess the gender differences in periodontal status and oral hygiene in systemically healthy and compromised individuals.

### Materials and Methods

This cross-sectional study was conducted in the Department of Periodontics, Saveetha Dental College and Hospitals, Chennai. A total of 200 patients who reported between December 2020 and January 2021 were enrolled. The patients were categorised based on gender and systemic disease status. Then the oral hygiene index-Simplified (OHI), probing pocket depth (PPD) and clinical attachment loss (CAL) were recorded. The ethical clearance was obtained from the Institutional Ethical Committee and written informed consent was obtained from all the study participants.

The data was analyzed using Statistical Package for Social Sciences (SPSS Software, Version 23.0). Chi-square test was done for data summarization and presentation. The results were considered statistically significant when the p-value was <0.05.

### Results

A total of 200 patients were recruited in the study. Among the 200 patients, 96 were males and 104 were females. These 200 patients were further divided based on their systemic status into 4 groups, of which 24% males were systemically healthy, 26% females were systemically healthy, 24% were systemically compromised males and 26% were systemically compromised females.

Among systemically healthy males, 11.0% had OHI-S score of 0.0-0.6 (good), 6% had OHI-S score range of 0.7-1.8 (fair) and 7.0% had an OHI-S score of 1.9-3.0 (poor). Among healthy females, 13.0% had good oral hygiene, 11.0% had fair oral hygiene and 2.0% had poor oral hygiene. Among systemically compromised males, only 1.00% had good oral hygiene, 6.00% had fair and 17.00% had poor oral hygiene. Also among systemically compromised females, 1.0%, 9% and 16.0% had good, fair and poor oral hygiene status respectively. The association between oral hygiene index (OHI-S), gender and systemic health status was found to be statistically significant (p<0.05). (Figure 1).

Among systemically healthy males, 9.0% had PPD of 1-3mm, 9.0% had PPD of 4-6mm and 6.0% had PPD greater than 6mm. Among systemically healthy females, 13.0% of them had PPD of 1-3mm, 10.0% had 4-6mm and 3.0% had greater than 6mm. Among systemically compromised males, 4.00% of them had PPD of 1-3mm, 14.00% had PPD of 4-6mm and the rest 6.00% had >6mm. Among systemically compromised females, 9.0% of them had PPD of 1-3mm, 9% of them had PPD of 4-6mm and 5.0% had PPD of >6mm. The association between probing pocket depth (PPD), gender and systemic health status was found to be statistically significant (p<0.05). (Figure 2).

Among systemically healthy males, 7.0% of them had CAL of 1-3mm, 10.0% of them had CAL of 4-6mm and 7.0% had CAL greater than 6mm. Among systemically healthy females, 13.0% had CAL of 1-3mm, 10.0% had CAL of 4-6mm and 3.0% had CAL greater than 6mm. Among systemically compromised males, 9.00% had a CAL of 4-6mm and 15.00% had CAL greater than 6mm. Among systemically compromised females, 3.0% had CAL of 1-3mm, 12.0% had CAL of 4-6mm and 13.0% had CAL great-

**Figure 1. Graph depicts the correlation between oral hygiene index (OHI), gender and systemic health status. The X-axis represents the gender of the subjects and the Y-axis represents the OHI-S of the subjects. In the graph, purple represents OHI-S of 0.0-0.6mm, green represents OHI-S of 0.7-1.8mm and red represents OHI-S of 1.9-3mm. Majority of the systemically compromised males (17%) had poor oral hygiene (OHI-S of 1.9-3mm). The association between oral hygiene index (OHI-S), gender and systemic health status was found to be statistically significant (p<0.05) (Chi-square test).**

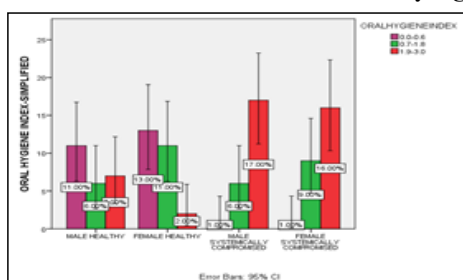


Figure 2. Correlation graph between probing pocket depth (PPD), gender and systemic health status. The X-axis represents the gender of the subjects and the Y-axis represents the PPD of the subjects. In the above graph, purple represents PPD of 1-3mm, green represents PPD of 4-6mm and red represents PPD greater than 6mm. Majority of the systemically compromised males (6%) had greater PPD. The association PPD, gender and systemic health status was found to be statistically significant ( $p < 0.05$ ) (Chi-square test).

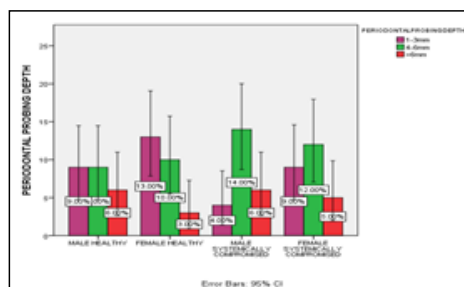
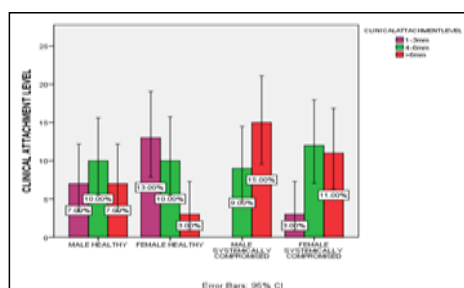


Figure 3: Correlation graph between clinical attachment loss (CAL), gender and systemic health status. The X-axis represents the gender of the subjects and the Y-axis represents the CAL of the subjects. In the graph, purple represents CAL of 1-3mm, green represents CAL of 4-6mm and red represents CAL greater than 6mm. Majority of systemically compromised males (15%) had greater CAL. The association between clinical attachment level (CAL), gender and systemic health status was found to be statistically significant ( $p < 0.05$ ). (Chi-square test).



er than 6mm. The association between clinical attachment loss (CAL), gender and systemic health status were found to be statistically significant ( $p < 0.05$ ). (Figure 3).

### Discussion

The present study was done to assess the gender differences in periodontal status and oral hygiene status among systemically healthy and systemically compromised individuals.

In the present study, it was observed that males had poor oral hygiene, greater PPD and CAL when compared to females. Fukai K *et al.*, [52] conducted a study among 207 males and 196 females belonging to the age group of 20-64 years and found that males had poorer brushing habits than females. Use of mouthwash, flossing and better dental hygiene behaviours likely explain the better oral hygiene in women. The percentage visiting the dental clinic for regular examination was higher in females than in males. Examining the relationship between oral hygiene status and oral health habits it was found that men had poor oral hygiene than women.

Al Ansari *et al.*, [53] conducted a cross-sectional study among 700 students, of which 153 were males and 547 were females. It was reported that oral health was good among female students when compared to males. Shiau HJ *et al.*, [54] conducted a systematic review to estimate the sex-related differences in the prevalence of periodontitis and reported that men appear at greater risk for periodontal disease than women. Shah P *et al.*, [9] in the retrospective study showed that the prevalence of periodontitis was higher in males when compared to females. The results of the present study are in agreement with the previous studies.

Also in the present study, it was observed that systemically compromised individuals had poor oral hygiene status, greater PPD and CAL as compared to systemically healthy individuals. Antina Schulze *et al.*, [55] investigated the relationship between gender differences in periodontal status and oral hygiene status in Non-Diabetic and Type 2 Diabetic patients. This study was conducted among 171 non-diabetic, 205 type 2 diabetic patients. This study concluded that oral hygiene behaviour was poor in males and also periodontitis was more severe in males than in females. It also showed that diabetic individuals showed a greater risk of periodontal diseases compared to non-diabetic individuals.

Nikhil Sharma *et al.*, [56] studied the association between respiratory disease and periodontitis. A group of 100 hospitalized patients with respiratory disease and a group of systemically healthy patients from the outpatient clinic were checked for their OHI, gingival inflammation, pocket depths, and CAL. The results indicated that patients with respiratory disease had significantly poor periodontal health. Karthikeyan *et al.*, [1] conducted a study among patients with chronic periodontitis and found that tooth loss was more frequent in males as compared to females. Thanish AS *et al.*, [3] stated that the prevalence of tooth loss was high among chronic periodontitis patients with diabetes compared to patients without diabetes.

Kandhan T *et al.*, [8] conducted a study among 1000 patients (n=500 patients without systemic diseases and n=500: patients with systemic diseases) and observed that systemically compromised patients were more prone to periodontitis than systemically healthy patients. Rajeshwaran N *et al.*, [5] assessed the distribu-

tion of angular defects in chronic periodontitis patients with and without systemic diseases and reported a higher prevalence of angular bone defects in chronic periodontitis patients with systemic diseases. Shukri N *et al.*, [12] in the retrospective study showed a greater prevalence of gingivitis and periodontitis among diabetic patients. The results of the present study are in accordance with the previous studies as the systemically compromised patients showed greater PPD and CAL when compared with systemically healthy individuals.

## Conclusion

The present study suggests that males presented with poor oral hygiene status, greater probing pocket depth and greater clinical attachment loss when compared to females. Also, when systemically compromised and systemically healthy individuals were compared, systemically compromised patients showed poor oral hygiene status, greater probing pocket depth and greater clinical attachment loss.

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