

Assessment of Periodontal Status among Patients with Class I and Class II Malocclusion-A Retrospective Study

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Abstract:

Periodontitis is defined as an inflammatory disease of the supporting tissues. Therapies done under other disciplines of dentistry are known to affect periodontal health. Orthodontic therapy may either improve or harm periodontal health depending on the circumstances. The other belief is that orthodontics improves periodontal health overall. There is however minimal evidence regarding possible association between factors such as type of orthodontic malocclusion and periodontitis. The aim of the study was to assess the periodontal status among patients with Class I and Class II malocclusion. A retrospective study was conducted using case records of patients in a private institution from June 2019 to March 2020. A total of 200 patients, 100 patients with Class I malocclusion; 100 patients with Class II malocclusion) were recruited. Data regarding the periodontal status of the patients were collected from their records. Descriptive and inferential statistics were done using SPSS software. The present study showed that there was a higher prevalence of gingivitis in patients with class II malocclusion (45%) than those with class I malocclusion (42.5%). Also, the prevalence of periodontitis was higher among patients with class II malocclusion (7.5%) than those with class I malocclusion (5%). Also, there was a statistically significant association between gender and periodontal health status ($p=0.04$).

Keywords: Class I malocclusion; Class II malocclusion; Gingivitis; Periodontitis**INTRODUCTION:**

Periodontitis is defined as an inflammatory disease of the 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 (Newman et al., 2011; Saini et al., 2009).

The risk factors which contribute to periodontal disease (Avinash et al., 2017; Kavarthapu and Thamaraiselvan, 2018; Ramesh et al., 2019) can be classified as Modifiable factors and Non Modifiable factors. Modifiable factors include microorganisms, smoking (Gajendran et al., 2018), diabetes, etc. Non-modifiable factors (Priyanka et al., 2017) include Osteoporosis, Host response (Khalid et al., 2016, 2017; Mootha et al., 2016; Varghese et al., 2015), hormonal changes, etc (AlJehani, 2014). There are various treatment modalities used for the treatment of periodontitis (Panda et al., 2014; Ramesh et al., 2016, 2017; Ravi et al., 2017; Thamaraiselvan et al., 2015). Treatment done under other disciplines of dentistry are

also known to affect periodontal health. These include orthodontic therapy, prosthetic replacement and endodontic therapy.

The crowding of teeth creates areas hardly accessible for tooth brushing and makes oral hygiene measures very difficult (Addy et al., 1988). Previous literature states that various types of malocclusions have also been correlated to increased plaque indices (Ashley et al., 1998; Buckley, 1981). In a study by Ainamo et al., it was found that the extent of periodontal disease was worse around malaligned teeth than around aligned teeth (Ainamo, 1972). Gusmao et al., found in their study that all tooth malpositions lead to occlusal trauma which further lead to periodontal disease progression (Gusmao et al., 2011).

A study by Bollen et al. claimed that orthodontic therapy may either improve or harm periodontal health depending on the circumstances (Bollen et al., 2008). Oral hygiene (Ramamurthy and Mg, 2018) may also be harder to maintain during orthodontic treatment which may lead to plaque accumulation and inflammation (Eid et al., 2014; Gorbunkova et al., 2016; Zanatta et al., 2012).

A Previous study by Cardoropoli et al has concluded that orthodontic forces may have negative effects on the periodontal tissues as prevalence of gingival inflammation is high in these cases(Cardaropoli and Gaveglio, 2007). However according to the American Association of Orthodontists, the commonly held belief is that orthodontics improves periodontal health overall(Wynne, n.d.).

There is however minimal evidence regarding possible association between factors such as type of orthodontic malocclusion, treatment, gender,age, population size and periodontitis(Kloehn and Pfeifer, 1974). In this context, the present study was undertaken to evaluate the periodontal status among patients with Class I and Class II malocclusion.

MATERIALS AND METHODS:

A retrospective study was conducted to find out the periodontal status in patients with Class I and Class II malocclusion. The study was done using the case records of patients in a private institution between June 2019 to March 2020. Prior permission to utilize the data for study and analysis was obtained from the Institutional Research Committee under ethical approval number SDC/SIHEC/2020/DIASDATA/0619-0320. A total of 200 patients (100 patients with Class I malocclusion; 100 patients with Class II malocclusion) were recruited. Patients between 18-35 years were enrolled. Data regarding the periodontal status of the patients were collected from their records. Descriptive (frequency distribution and percentage) and inferential statistics (chi-square test) were done using SPSS software, Version 23

RESULTS AND DISCUSSION:

In the present study, 100 patients with Class I and 100 patients with Class II malocclusion were included. All the study participants were between 18-35 years with the mean age of 25.5 years.Out of 100 patients with Class I malocclusion, 45% of patients had gingivitis and 5% had periodontitis. Out of 100 patients with Class II malocclusion, 42.5% had gingivitis and 7.5% had periodontitis. Also, the association between type of malocclusion and periodontal status was assessed by Chi square test and was found to be statistically not significant with the p value of 0.28 (Figure 1).

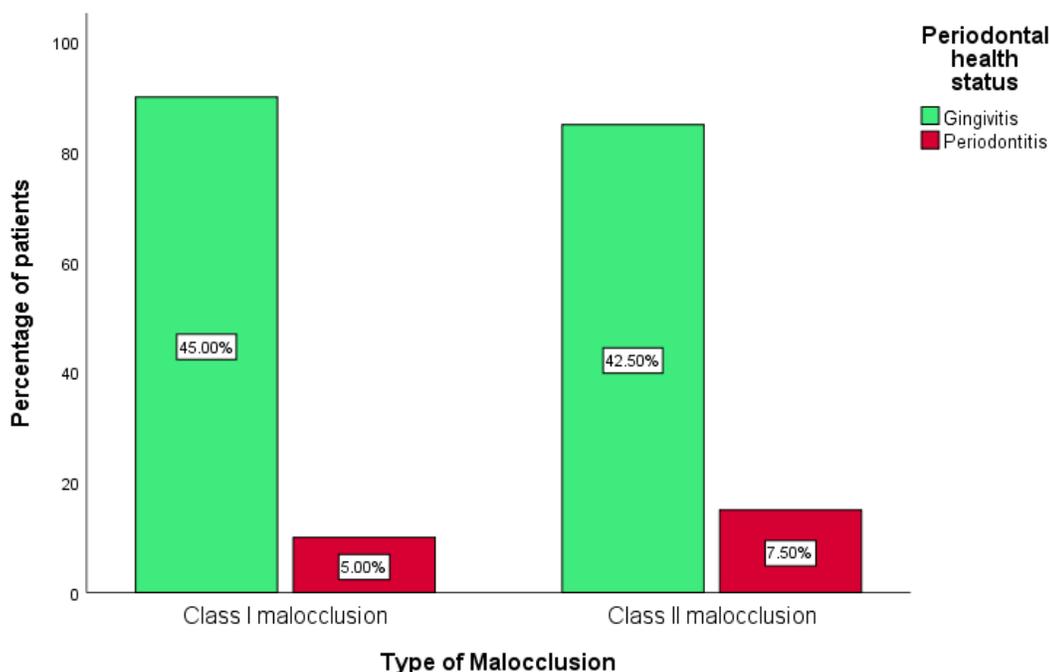


Figure 1: Bar chart depicting the association between type of malocclusion and periodontal health status; X axis denotes the type of malocclusion (Class I Malocclusion and Class II Malocclusion) and Y axis denotes the percentage of patients. Red denotes periodontitis and green denotes gingivitis. Higher prevalence of gingivitis in patients with class II malocclusion (45%) than those with class I malocclusion (42.5%). Also, the prevalence of periodontitis was higher among patients with class II malocclusion (7.5%) than those with class I malocclusion (5%).

Association between type of malocclusion and periodontal status was not statistically significant (Chi-square analysis; p value=0.28).

Among the study population, 54.5% were females and 45.5% were males. Out of the 109 female patients, 50% had gingivitis and 4.5% had periodontitis. Out of the 91 male patients, 37.5% had gingivitis and 8% had periodontitis. Also the association between gender and periodontal status was assessed by Chi square test and was found to be statistically significant with the p value of 0.04 (Figure 2).

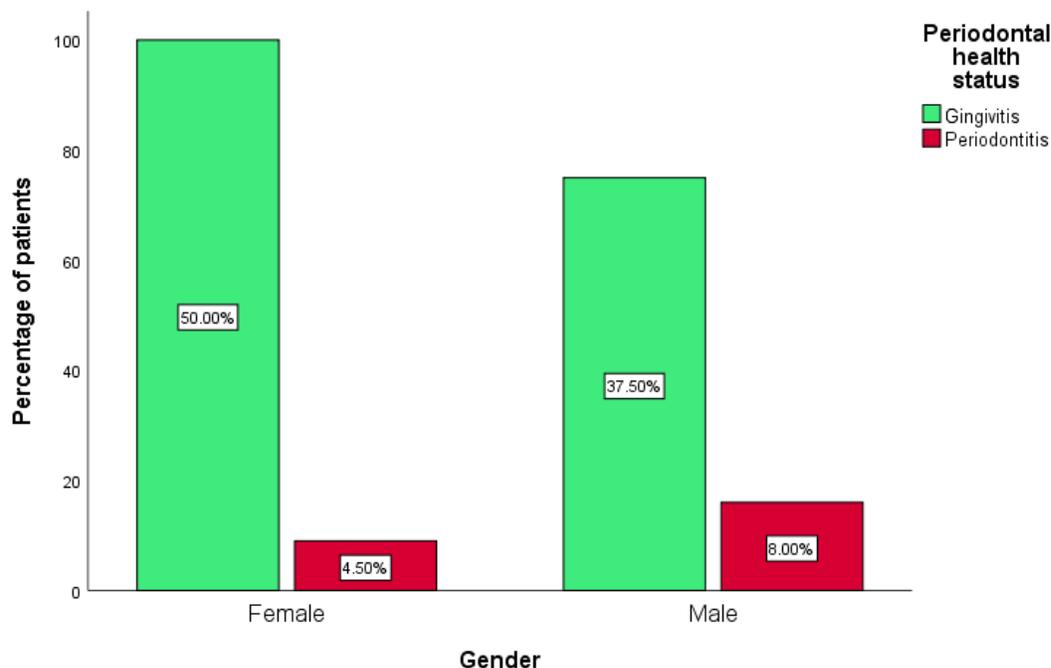


Figure 2: Bar chart depicting the association between gender and periodontal status. X axis denotes the Gender (Female and Male) and Y axis denotes the percentage of patients. Red denotes periodontitis and green denotes gingivitis. Higher prevalence of gingivitis in females (50%) than males (37.5%). Also, the prevalence of periodontitis was higher among males (8%) than females (4.5%). Association between gender and periodontal status was statistically significant (Chi-square analysis; p value=0.04).

Previous studies have found association between occlusal forces and pocket formation and progression (Burgett et al., 1992; Harrel and Nunn, 2001; Nunn and Harrel, 2001). Further studies have found evidence of association weak and inconsistent (Helm et al., 1984; Onyeaso et al., 2003b). The reported relationships between crowding and periodontal status have ranged from no relationship (Ngom et al., 2006), to a weak relationship (Onyeaso et al., 2003a). These findings are consistent with those of the present study which states that there is no significant association between the

type of malocclusion and the periodontal health status. In a similar study by Shefter et al, no influence was found of the type of malocclusion on the periodontal health status of the study participants (Shefter and McFall, 1984).

Significant association was found between gender and periodontal health status. Males were also found to have higher prevalence of periodontitis than females. These findings were in consensus with the findings of Shiau et al, who found higher susceptibility to periodontitis in males than females (Shiau and Reynolds, 2010). In a similar study by Helm et al, it was found that men are at greater risk for periodontal disease than women (Helm and Petersen, 1989).

The present study also found greater prevalence of periodontitis among patients with Class II malocclusion than in patients with Class I malocclusion. These findings were contradictory to the findings of Geiger et al, as in their study, Class I malocclusions showed a trend toward more

periodontal disease than Class II malocclusion (Geiger et al., 1974).

The limitations of the study include that it is a single centre study with limited sample size and homogeneity of the sample population. Further multicentre studies should be conducted with a larger population.

CONCLUSION

Within the limitations of the study, it can be concluded that there was a higher prevalence of gingivitis in patients with class II malocclusion (45%) than those with class I malocclusion (42.5%). Also, the prevalence of periodontitis was higher among patients with class II malocclusion (7.5%) than those with class I malocclusion (5%).

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AUTHORS CONTRIBUTION

Kadambari Sriram performed the analysis, interpretation and drafted the manuscript. Arvina Rajasekar contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Santhosh Kumar participated in the study and revised the manuscript. All the three authors equally contributed to the manuscript.

CONFLICT OF INTEREST

None declared.

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