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Research Article

PERIODONTAL STATUS ASSESSMENT IN ORTHODONTIC PATIENTS IN NISHTAR INSTITUTE OF DENTISTRY MULTAN

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Abstract:

Aim: To assess the periodontal status of orthodontically treated patients and to compare the periodontal status of patients with and without orthodontic treatment.

Materials and Methods: A cross-sectional study was conducted on 50 orthodontic patients, i.e the orthodontic group and 50 non-orthodontic patients, i.e a non-orthodontic group selected from the Orthodontic and Periodontics Department of Nishtar Institute of Dentistry Multan for one-year duration from May 2019 to May 2020. CPITN (Community Periodontal Index for Treatment Need) was used to assess the periodontal condition of indexed teeth. SPSS version 17 and Chi Square test were used to analyze and compare the data.

Result: A statistically significant relationship was found on the CPITN scale between orthodontic and non-orthodontic patients ($p < 0.01$).

Conclusion: Patients undergoing orthodontic treatment have increased plaque accumulation and probing depth, which may be associated with periodontal destruction. Motivating the patient to maintain oral hygiene and scaling regularly will minimize the dangerous effects on orthodontic patients.

Key words: CPITN, ongoing orthodontic treatment, gingivitis, pocket depth

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INTRODUCTION:

Gingivitis is an inflammation of the gums that surround your teeth. Gingivitis is one of the periodontitis diseases. Fixed orthodontic appliances can make plaque removal difficult, maintain good oral hygiene and affect gum health. Gingivitis can develop in patients who lack proper oral care and may worsen within 21 days¹⁻². During orthodontic treatment, patients often show gingival overgrowth, bleeding, increased plaque build-up, and tartar formation. Accordingly, oral hygiene measures are recommended as bands, zippers, ligature wires and rubber bands promote the build-up of bacterial flora and food debris³⁻⁴. Over time, a build-up of plaque around orthodontic appliances can cause periodontal disease and tooth decay. The aim of the study was to evaluate the periodontium of patients under orthodontic treatment and to compare the periodontium of patients with or without orthodontic treatment.

MATERIALS AND METHODS:

A cross-sectional study was conducted on 50 orthodontic patients, ie the orthodontic group and 50 non-orthodontic patients, ie a non-orthodontic group selected from the Orthodontic and Periodontics Department of Nistar Institute of Dentistry Multan for one-year duration from May 2019 to May 2020. The patients included in the study were in the age range of 15–28 years of both sexes, with a period of more than 3 months from the start of orthodontic treatment. Patients with systemic diseases, generalized periodontal problems / diseases, cysts, clefts or congenital malformations, and patients undergoing treatment with removable appliances were excluded from the study. All patients were assessed using CPITN (Community Periodontal Index for Treatment

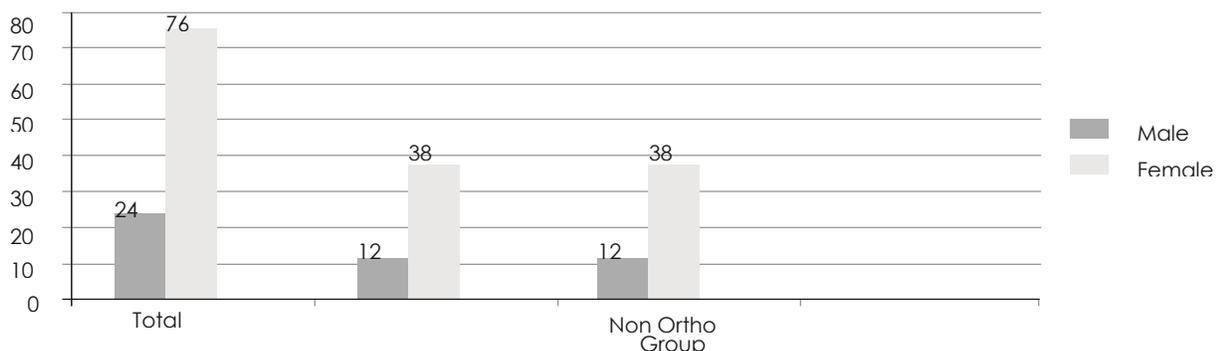
Need) on index teeth (16, 11, 26, 36, 31, 46). Data recording was based on the WHO Oral Health Assessment Survey Form (proforma). A questionnaire was used to assess participants' use of oral hygiene products.

Examination procedure

Each patient was examined in a dentist's chair under appropriate natural light using an oral mirror and a WHO CPITN probe. The study was conducted in a systemic manner, starting with the right maxillary sextant. The probe tip was gently inserted parallel to the long axis of the tooth, between the tooth and the gingiva, starting from the posterior cheek surface of the index tooth, to the full depth of the groove or pocket, and the probing depth was read by observing the black position of the black strip. The sites probed included the distal, medial, and mesial surfaces of both the face and tongue / palate. The respective highest score for each sextant was determined and recorded in the appropriate field. The following CPI coding system was used to record periodontal status: 0, periodontium healthy; 1, bleeding observed after probing; 2, tartar detected during probing, but a black strip on the probe was visible; 3, a 4-5 mm pocket (the black strip on the probe is on the gingival margin); 4, pocket ≥ 6 mm (black strip on the probe invisible); X, sextant excluded (> 2 teeth present); and 9, not recorded. All recorded data were statistically analyzed using SPSS version 17 and various comparisons were made using the chi-square test.

RESULTS:

Of the 100 patients studied, 24 were male and 76 female; A detailed breakdown of the subjects is shown in Figure 1.



The age range of the patients ranged from 15 to 28 years. Out of 50 patients in the orthopedic group; 30 patients, ie 60%, had a periodontal pocket (CPITN score 3 and 4). Table 1 shows the CPITN Score distribution between orthodontic and non-orthodontic patients. Comparing the CPITN score between the orthodontic group and the non-ortho group, 81.1% had a periodontal pocket (CPITN score 3 and 4) in the orthodontic group, while only 18.9% had a periodontal pocket (CPITN score 3 and 4) in the non-ortho group.

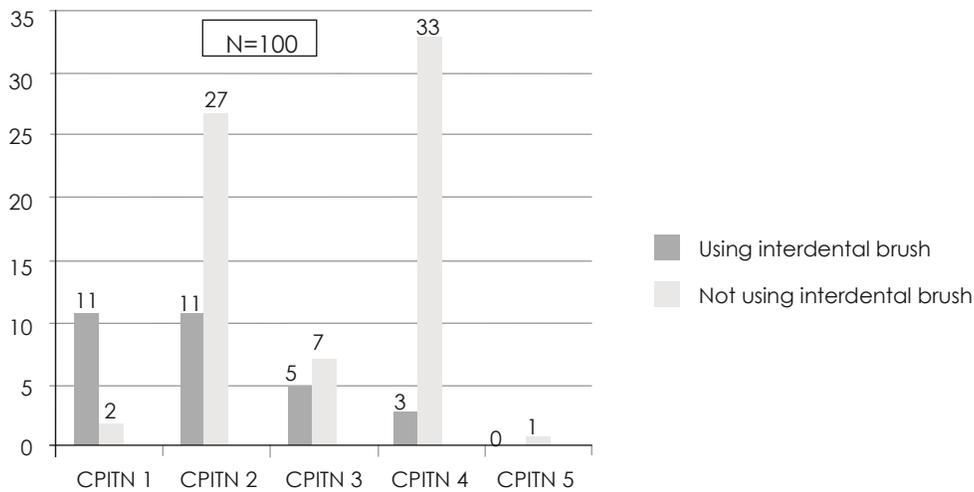
Table 1: Distribution of CPITN Score among orthodontic and non-orthodontic patients

CPITN	Score 0	Score 1	Score 2	Score 3	Score 4	Total
Orthodontic patient	2	14	4	29	1	50
Non-orthodontic patient	11	24	8	7	0	50

Table 2: Comparison of CPITN Score between orthodontic and non-orthodontic patients

CPITN	Score 0,1,2	Score 3,4	<i>p-value</i>
Orthodontic patient (N=50)	20 (31.7%)	30 (81.1%)	0.000*
Non-orthodontic patient (N=50)	43 (68.3%)	7 (18.9%)	

There is a statistically significant relationship between the advancement of periodontal disease in the orthodontic and non-orthodontic groups ($p < 0.01$) (Table 2). A comparison of patients using and not using interdental devices in all subjects is presented in Figure 2.

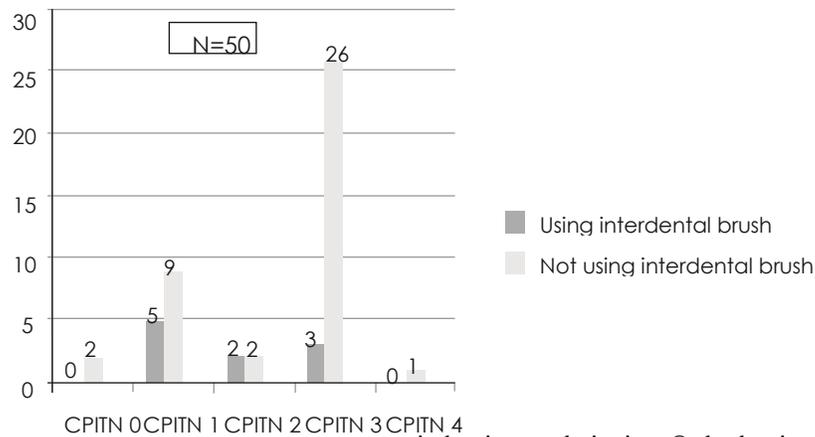
**Figure 2: Distribution of CPI score and use of interdental aids**

The study showed that only 3% of patients using interdental aids had a periodontal pocket (CPITN scores 3 and 4); while 34% had a periodontal pocket that did not use interdental aids (CPITN scores 3 and 4). There is a significant relationship in the advancement of periodontal disease between users of interdental assistance and non-users in all patients ($p < 0.01$) (Table 3).

Table 3: Comparison of CPITN Score between interdental aids uses and non-users

CPITN score	Score 0,1,2	Score 3,4	<i>p value</i>
Using interdental aids (N=30)	27 (90%)	3 (10%)	0.000*
Not using interdental aids (N=70)	36 (51.4%)	34 (48.6%)	

Among orthodontic patients, only 3 (6%) who used an interdental brush had a periodontal pocket (CPITN 3 and 4), while 27 (54%) had a periodontal pocket (CPITN 3 and 4) who did not use it (Fig. 3).



DISCUSSION:

The study assessed the periodontium of orthodontic and non-orthodontic patients. Data in patients receiving regular orthodontic treatment showed an increase in CPITN⁴⁻⁵. This is consistent with the results of Naranjo et al, who found that bracket placement influenced the ecological environment of the retention sites through biofilm accumulation⁶⁻⁷. In the experimental group, there was a marked increase in the plaque and gingival index, which resulted in more bleeding and inflammation than periodontal deterioration. Similar results were obtained by Ristic et al., Because after 3 months from the insertion of the fixed appliance, there was a significant increase in clinical and microbiological parameters. There was a significant difference in CPITN scores between the orthodontic and non-orthodontic groups⁸⁻⁹. Patients using interdental devices had a significantly lower CPITN result compared to patients not using interdental devices. CPITN scores were higher in orthodontic patients who did not use interdental aids. The build-up of plaque on orthodontic appliances makes it difficult for patients to maintain oral hygiene. Therefore, it can be assumed that the installation of fixed orthodontic appliances may result in the deposition of dental plaque, increasing the depth of the pockets, leading to an increase in the CPITN score¹⁰⁻¹¹. Baer et al. Have suggested that the interdental areas are particularly affected periodontically in orthodontic patients. It reflects and ensures the ability of fixed orthodontic appliances to accumulate plaque, which is the initiator of periodontal disease. These results are in line with the results of other studies. There is a certain deep furrow in the human gums. The depth of the periodontal sulcus was determined differently, in some studies the depth was 1.5 mm, and in others 1.8 mm. Radiographs indicate areas of bone loss where pockets may be suspected. Zachrisson et al. Report an increase in probing depth and a slight loss of attachment around the teeth in patients undergoing orthodontic treatment using fixed orthodontic appliances. Plaque is a major etiological factor in almost all conditions of the

periodontium and gingiva. Orthodontic appliances are a challenge for the proper removal of plaque from the surface of the teeth and gums. Organisms commonly present in early plaque include gram-positive rods and cocci¹²⁻¹³. Over time, these organisms are replaced by more gram-negative and anaerobic organisms that can initiate a periodontal response. Orthodontic appliances cause mechanical traps in plaque, in which the plaque can become pathologic because it is more difficult to maintain proper oral hygiene during orthodontic treatment. Therefore, it should be emphasized that plaque control is the most important factor in maintaining periodontal health in patients undergoing orthodontic treatment. Motivating and encouraging them to practice oral hygiene in young groups will certainly raise the level of oral hygiene standards¹⁴⁻¹⁵. Electric and interdental brushes and special types of floss have been shown to improve plaque control in orthodontic patients.

CONCLUSION:

During orthodontic treatment, plaque and pocket depth increase, which causes periodontitis, but does not cause severe bone loss, mobility, and tooth loss. The gingiva was relatively stable and no significant recessions were recorded. During orthodontic treatment, the patient's oral hygiene should be kept at a high level to minimize negative effects. Patient motivation and education in the field of oral hygiene are key elements of successful orthodontic treatment. Therefore, in order to control plaque, you should use appropriate oral hygiene methods and interdental aids.

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