ASSOCIATION BETWEEN PATIENTS’ CHIEF COMPLAINTS AND THEIR COMPLIANCE WITH PERIODONTAL THERAPY - RETROSPECTIVE STUDY

Subasree Soundarajan¹, Sankari Malaippan²*, Priyalochana Gajendran³

1. Department of Periodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India.
   Email: 151905002.sdc@saveetha.com

2. Professor, Department of Periodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

3. Email sankari@saveetha.com

4. Senior Lecturer, Department of Periodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India
   Email: priya.sdc@saveetha.com

*Corresponding author
Sankari Malaippan
   Professor
   Department of Periodontics
   Saveetha Dental College and Hospitals
   Saveetha Institute of Medical and Technical Sciences
   Saveetha University,
   162, PH Road, Chennai 600077,
   Tamil Nadu, India.
   Contact no: + 91 – 9840285905
   Email sankari@saveetha.com

ABSTRACT

Chronic periodontitis is a common form of destructive oral disease in adults. Early diagnosis and treatment of periodontitis is required for maintaining the periodontal health. Patient's chief complaint is considered as a vital component for providing competent and good quality health care. Chief complaints reported by the patients are said to have an influence on a patient's motivation towards periodontal treatment. The aim of the study was to evaluate the association between the patients’ chief complaints at the first periodontal visit and compliance with periodontal therapy. This retrospective study was carried out by analysing patient records from June 2019 to March 2020. Two hundred and forty four patients were included in the study. Parameters assessed were a)Demographic details – Patient name, Patient identity number, Age & Sex; b)Periodontal parameters – Periodontal probing depth (PDD), Loss of attachment (LOA), Bleeding on probing (BOP), Severity of Periodontitis (mild, moderate & severe); c)Chief complaints & type of chief complaints (chronic symptomatic, acute symptomatic & asymptomatic); d)Treatment status – Complete or incomplete treatment. Chi square test was performed to compare the gender of the patients, type of chief complaints and severity of periodontitis between incomplete & complete treatment groups. Statistical
significance was set at $p < 0.05$. Analyses were conducted with statistical software SPSS version 23.0 (Statistical Package For the Social Sciences). Bleeding gums (23%) was the most common chief complaint. Chi square tests showed that treatment completion status (Complete or incomplete treatment) differs significantly with type of chief complaints (Chronic, acute symptomatic or asymptomatic) with a $p$ value of 0.001. Most of the patients with acute symptoms did not report to the hospital after their chief complaint was treated in the first appointment. There was no significant relationship between treatment completion status and gender of the patients & severity of periodontitis. Patients’ chief complaints at their first visit were associated with their compliance with periodontal therapy, irrespective of other factors. The acute symptomatic chief complaints could be a positive predictor to begin periodontal treatment, but a negative predictor to complete the treatment.

**Keywords:** Chief complaint, compliance, periodontitis, periodontal diseases, motivation

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**INTRODUCTION**

Periodontitis is a chronic inflammatory disease, causing destruction of the supporting tissues of the dentition. Etiology of periodontitis is multifactorial and is affected by various risk factors. Gram-negative anaerobic bacteria play a major role in periodontal destruction. Recently, the viruses have been associated with the pathogenesis of chronic periodontitis (CP). Several viruses like cytomegalovirus (CMV) and Epstein–Barr virus (EBV) are of most importance (Priyanka et al., 2017). Chronic periodontitis is a host mediated inflammatory condition which is characterized by increased levels of cytokines and other inflammatory mediators. Tumor necrosis factor (TNF) is an important proinflammatory cytokine that causes destruction of periodontium (Varghese et al., 2015). The role of IL-1, 6, 8, & 12 has been periodontal destruction is well established. In recent days, interleukin-21 has (IL-21) obtained importance in causing exaggerated tissue inflammation and breakdown (Mootha et al., 2016). The expression of these pro-inflammatory cytokines is amplified by peptides like endothelin 1, which is a potent vasoconstrictor. Previous studies have found that ET-1 is expressed gingival tissues in case of chronic periodontitis or gingival overgrowth (Khalid et al., 2016, 2017). Evidence from the literature has proved that periodontitis is a risk factor for systemic conditions like cardiovascular diseases, diabetes, and respiratory disorders. Periodontitis and chronic obstructive pulmonary disease (COPD) share a common risk factor profile and both manifest as chronic inflammation with underlying connective tissue breakdown (Ramesh, Sheeja S. Varghese, et al., 2016).

The diagnosis of periodontal disease is done by assessing the clinical parameters such as probing depth, attachment level, bleeding on probing (BOP) and radiographic loss of alveolar bone. Recently, advanced radiographic diagnosis using Cone beam computed tomography has been used for better treatment planning of the disease (Kavarthapu and Thamaraiselvan, 2018). When periodontitis is left untreated, it might lead to loss of teeth,
function and aesthetics (Ramesh et al., 2019, Thamaraiselvan et al., 2015). Dental implants have become a crucial part of prosthetic rehabilitation in periodontitis over the last few years (Ramesh, Ravi and Kaarthikeyan, 2017).

Initial periodontal therapy is referred to as non-surgical periodontal therapy that includes scaling, root planning, systemic antimicrobials, and plaque control methods. Chemical antiplaque agents such as varnishes, dentifrices, and mouthwashes are used to improve oral health care. Commonly, mouthwashes like chlorhexidine, triclosan, cetylpyridinium chloride, have been used in the oral hygiene maintenance. Chlorhexidine mouthwash is considered as the gold standard due to its sensitivity. But it has adverse effects like unpleasant and altered taste sensation. Hence, herbal remedies have been used to achieve antimicrobial, antioxidant, and anti-inflammatory effects (Ramesh, Sheeja Saji Varghese, et al., 2016). Herbal substances like triphala extract mouthwash, Hioramouthwash, etc can be used as an alternative (Ramamurthy and Me, 2018).

Intra bony or angular defects can be managed by periodontal regenerative procedures. Along with bone graft materials, growth factors can be used as an adjunct. Platelet rich fibrin (PRF) is the second generation platelet concentrate, made up of viable platelets and growth factors like platelet-derived growth factor, transforming growth factor, vascular endothelial growth factor and insulin-like growth factor, epidermal growth factor (Panda et al., 2014; Ravi et al., 2017). In recent days, stem cells have been used for regenerative therapy. Dental tissues such as the PDL, the dental pulp and the tooth follicle have been recognized as readily available sources of adult stem cells (Avinash, Malaippan and Doraiswamy, 2017).

In clinical practice, defining the objectives of treatment protocol is an essential step in management of patients. This is determined on the basis of the patient’s needs (Baehni and Giovannoli, 2004). Patients’ chief complaints (CCs) and reasons for seeking care are important sources of information for the dentists. Most of the time, periodontal diseases are quiescent in nature, presenting with chronic or asymptomatic chief complaints (Demetriou, Parashis and Tsami-Pandi, 1990, Brunsvodl, Nair and Oates, 1999). Patients’ CCs correspond to their immediate requirement and may implicate their attitude towards periodontal treatment.

Many papers have focussed on patient compliance with supportive periodontal therapy (Konig et al., 2001, Ojima et al., 2005, Fardal, 2006, Lorentz et al., 2009, Matuliene et al., 2010), but only few studies have dealt with basic periodontal therapy (Kakudate, Morita and Kawanami, 2008). Non-surgical periodontal therapy including plaque control, scaling, and root planing, is the preliminary step in periodontal treatment (Badersten, Nilveus and Egelberg, 1987, Lowenguth and Greenstein, 1995). It is the basis of periodontal therapy, and it stands for successful management of periodontitis (Isidor and Karring, 1986, Badersten, Nilveus and Egelberg, 1987, Hujoel et al., 2000).

Compared to studies done in Western countries, clinical examinations in Indian population show relatively lower referrals and compliance levels for periodontal therapy. Community based screening shows high prevalence of periodontal disease in India (Shaju, Zade and Das, 2011). The concept of referral is just beginning and vague for Indian patients. Many patients do not depend on their general dentists for periodontal information and lack

professional assurance of treatment needs. Factors apart from referral that might influence patients’ decisions on periodontal treatment should be studied.

This study was performed to evaluate the association between the patient’s CC at the first periodontal visit and compliance with periodontal therapy. We compared the general profiles between completely and incompletely treated patients, to determine whether the CC influences the patient’s motivation towards periodontal treatment.

MATERIALS & METHOD -

Study design –

This is a retrospective study, carried out by analysis of the patient records from June 2019 to March 2020 were assessed. The study design was reviewed and approved by the Ethical Committee of Saveetha Institute of Medical and Technical Sciences (SIMATS).

Study population –

Data from two hundred and forty four patients who were diagnosed with chronic periodontitis and referred to the department of Periodontics, Saveetha Institute of Medical and Technical Sciences (SIMATS) were included in the study. Patients with aggressive periodontitis or any systemic diseases that may influence the periodontium like diabetes, pregnancy, immunological disorders & smokers were excluded from the study. Case sheets with incomplete data were excluded from the study.

Parameters examined –

a) Demographic details – Patient name, Patient identity number, Age & Sex.
b) Periodontal parameters – Periodontal probing depth (PDD), Loss of attachment (LOA), Bleeding on probing (BOP), Severity of Periodontitis (mild, moderate & severe).
c) Chief complaints & type of chief complaints (chronic symptomatic, acute symptomatic & asymptomatic).
d) Treatment status – Complete or incomplete treatment.

Statistical analysis –

All descriptive data were analysed using frequency distributions; Chi square test was performed to compare the gender of the patients, type of chief complaints and severity of periodontitis between incomplete & complete treatment groups. Statistical significance was set at p < 0.05. Analyses were conducted with a statistical software SPSS version 23.0 (Statistical Package For The Social Sciences).

RESULTS AND DISCUSSION –

A total of two hundred and forty four patients were included in the study. The mean age of the study sample was 40.82 (±11.38). Females constituted about 58.06%, whereas males constituted 41.4% of the study sample (Figure 1). About 64.76% of the study population had severe periodontitis, 17.21% had moderate periodontitis and 18.03% had mild periodontitis (Figure 2). Mean PPD was 5.24 (±1.30), mean CAL was 4.60 (±1.45) and mean BOP score was 0.98 (±0.25). Chronic symptomatic CCs includes Bad breath, Bleeding gums, mobile teeth, pain in gums, pain on chewing, pus discharge, sensitivity, swollen gums, moved position; Acute symptomatic CCs includes Toothache; Asymptomatic CCs includes Cleaning, missing teeth, need gum treatment. The most common chief complaint was bleeding gums (22.95%), second most common chief complaint was missing teeth (17.62%), and third most common chief complaint was tooth pain (15.98%) (Figure 3).

Comparison between complete & incomplete treatment subjects

Around 65% of the patients reported with chronic symptomatic CCs, 18% reported with asymptomatic CCs, 17% reported with acute symptomatic CCs (Figure 4). Out of the total population, 57% of the patients completed their periodontal treatment, whereas 43% of the patients’ treatment status was incomplete (Figure 5). Completely treated patients were dominant in having chronic symptomatic CCs (i.e. bleeding gums, mobile teeth, sensitivity, swollen gums, followed by asymptomatic CCs (i.e. missing teeth, need gum treatment), followed by asymptomatic CC i.e. toothache (Figure 6).

Chi square test was performed to compare the gender of the patients, type of chief complaints and severity of periodontitis between incomplete & complete treatment groups. Association between treatment completion status and gender was found to be statistically insignificant. (Pearson’s Chi square value: 0.148, df - 1, p value - 0.701 - not significant). Males (32.79%) showed higher treatment completion status than females (24.18%) However, there is no statistically significant difference in the treatment completion status between males and females (Figure 7). Association between treatment completion status and type of CC was found to be statistically significant.(Pearson’s Chi square value : 14.395, df - 2, p value - 0.001 - significant). Hence, there is a significant relationship between patient compliance and type of chief complaints. Most patients who had chronic symptoms (41.80%) were more compliant than patients with acute symptoms (4.92%). Patients with acute symptoms did not report for further treatment after their first appointment (Figure 8). Association between treatment completion status and severity of periodontitis was found to be statistically insignificant.(Pearson’s Chi square value : 2.82, df - 2, p value - 0.244 - not significant). Patients diagnosed with severe periodontitis had higher treatment completion status (39.34%), followed by mild periodontitis (9.43%) and moderate periodontitis (8.20%). However, there was no statistically significant difference in the treatment completion status between mild, moderate and severe periodontitis patients.

In the present study, bleeding gums (23%) was the most common chief complaint reported by patients who came to the department of periodontics in SIMATS. Whereas in a similar study performed by Yeh et al , most commonly patients stated that “they need gum treatment”(Yeh and Lai, 2011). This study was done in Taiwan. This difference is because of the lack of awareness about gum diseases among Indian population. According to
Prochaska & Velicer 1997, awareness is the key to change behaviour and accept treatment (Prochaska and Velicer, 1997).

In the present study, treatment completion status differs significantly with type of chief complaints (chronic symptoms, acute symptoms or asymptomatic) ($p = 0.001$). Most patients who had chronic symptoms (41.80%) were more compliant than patients with acute symptoms (4.92%). Patients with acute symptoms did not report for further treatment after their first appointment. This finding was in accordance with a study done by Yeh et al, where subjects with acute symptomatic CCs were 60% less likely to complete periodontal treatment (Yeh and Lai, 2011). According to Rizzardo et al, apprehension, anxiety and fear of dental treatment may compromise the patients’ compliance for the treatment (Rizzardo, Borgherini and Cappelletti, 1991). Fardal et al 2001 reported that most patients have anxiety about pending treatment, with the main concern being pain (Fardal, Johannessen and Linden, 2001).

![Figure 1: Pie chart representing gender distribution of the study population. Purple denotes males and blue denotes females. 58.61% of the study population were males and 41.39% of the study population were females.](image-url)
Figure 2: Pie chart representing Severity of periodontitis in the study population. Blue denotes Mild periodontitis (LOA = < 3 mm), green denotes Moderate periodontitis (LOA = 3-4 mm at ≥ 30% sites), orange denotes Severe periodontitis (LOA ≥ 5 mm at ≥ 30% of sites). From figure 2, we can infer that out of the study population, 64.75% were diagnosed with severe periodontitis, followed by mild periodontitis (18.03%), followed by moderate periodontitis (17.21%).

Figure 3: Pie chart representing Distribution of Chief complaints. Chronic symptomatic CCs includes Bad breath, Bleeding gums, mobile teeth, pain in gums, pain on chewing, pus discharge, sensitivity, swollen gums, moved
position; Acute symptomatic CCs includes Toothache; Asymptomatic CCs includes Cleaning, missing teeth, need gum treatment. From the figure 3, we can infer that the most common chief complaint was bleeding gums (23%), followed by missing teeth (17.62%), and followed by tooth pain (15.98%).

Figure 4: Pie chart depicting the distribution of type of chief complaints reported by the study population. Blue denotes Chronic symptomatic CCs that includes bad breath, bleeding gums, mobile teeth, pain in gums, pain on chewing, pus discharge, sensitivity, swollen gums, moved position; Yellow denotes Acute symptomatic CCs that includes toothache; Pink denotes Asymptomatic CCs that includes cleaning, missing teeth, need gum treatment. From figure 4, we can infer that most of the patients with periodontitis reported with Chronic symptomatic chief complaints (65.16%).

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Figure 5: Pie chart depicting the distribution of treatment completion status among the study population. Green denotes complete treatment and red denotes incomplete treatment. From figure 5, it is found that 56.79% of patients with periodontitis underwent complete periodontal therapy. However, 43.03% of the patients did not undergo complete treatment.
Figure 6: Bar graph depicting the distribution of chief complaints (CCs) in patients with complete and incomplete periodontal treatment. X axis represents the chief complaints and Y axis represents the number of patients. Green denotes complete treatment and red denotes incomplete treatment. From figure 6, we can infer that patients who reported with chronic symptomatic CC (like bleeding gums, mobile teeth) underwent complete treatment. Whereas patients who reported with acute complaints like toothache, did not undergo complete periodontal therapy.
Figure 7: Bar graph depicting the relationship between the Treatment completion status and gender of the patients. X axis represents the gender of the patients and Y axis represents the number of patients. Green denotes complete treatment and red denotes incomplete treatment. From figure 7, we can infer that males (32.8%) were more compliant than females (24.18%). However, association between treatment completion status and gender was not statistically significant (Chi square test; df - 1, p value - 0.701 - not significant).
Figure 8: Bar graph depicting the relationship between the Treatment completion status and type of chief complaint reported by the patients. X axis represents the type of chief complaints and Y axis represents the number of patients. Green denotes complete treatment and red denotes incomplete treatment. From figure 8, we can infer that patients who had chronic symptoms (41.80%) were more compliant than patients with acute symptoms (4.92%). Association between treatment completion status and type of CC was statistically significant (Chi square test; df = 2, p value = 0.001 (<0.05) - significant).
Figure 9: Bar graph depicting the relationship between the Treatment completion status and severity of periodontitis. X axis represents the severity of periodontitis and Y axis represents the number of patients. Green denotes complete treatment and red denotes incomplete treatment. From figure 9, we can infer that patients diagnosed with severe periodontitis had higher treatment completion status (39.34%) than patients with mild periodontitis (9.43%) and moderate periodontitis (8.20%). However, association between treatment completion status and severity of periodontitis was not statistically significant (Chi square test; df - 2, p value - 0.244 - not significant).

Limitations & Future scopes -

Our study solely depends on the ability of the patients to express their complaints. Patients may not reveal all his problems, or may even hide some of his problems, assuming that they may be irrelevant. Difference in the interpretation of the chief complaints by the examining dentist can affect the recording of the CC. Factors like educational level, travel distance, smoking status & socioeconomic status may influence patient compliance, they were not included in the study. Effect of patient motivation on compliance should be studied. Further longitudinal studies with larger sample size are needed to be done.

CONCLUSION
Patients’ chief complaints at their first visit were associated with their compliance with periodontal therapy, irrespective of other factors. The acute symptomatic chief complaints could be a positive predictor to begin periodontal treatment, but a negative predictor to complete the treatment. Long term assessment based on complaint and compliance would be a useful tool to measure the success of periodontal therapy.

REFERENCES


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