

ORIGINAL RESEARCH

Association between Psychological parameters with chronic periodontitis

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ABSTRACT

Background: It is thought that chronic stress negatively affects immune response efficacy which in turn cause an imbalance between host and parasite leading to periodontal breakdown. The current research aimed to investigate the association between anxiety and depression with chronic periodontitis. **Materials & Methods:** 100 participants in this cross-sectional study, who were all over 25 years old and of both sexes, were included. The study participants were split into two groups. Subjects in Group B had clinical attachment loss of at least ≥ 3 mm in at least 30% of the sites inspected, and Group A samples did not meet the aforementioned requirements. Group A had 60 participants, whereas Group B had 40. One examiner conducted all of the clinical examinations. The Hospital Anxiety and Depression Scale (HADS) was the psychological tool that was used. To compare the two groups, the chi square and student t tests were used. **Results:** The mean depression scores in Group A and Group B were 6.64 ± 2.58 and 7.90 ± 2.86 , respectively while the mean anxiety scores of Group A and Group B were 7.76 ± 3.12 and 9.07 ± 3.08 , respectively ($p < 0.01$). **Conclusion:** Within the limits of this study, it is possible to conclude that there was significant association between periodontitis and anxiety, and depression.

Key words: Anxiety, depression, clinical attachment loss, periodontitis.

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INTRODUCTION

Periodontal disease is an inflammatory process that affects the protective and supportive tissues around the tooth. Bacterial plaque accumulation on the tooth surface leads to marginal tissue inflammation, known as gingivitis. Gingivitis is fairly common and is present in up to 90% of the US population.¹ If left untreated, gingivitis may progress to periodontitis, which is characterized by loss of periodontal attachment support (clinical attachment loss, [CAL]) and bone resorption, eventually resulting in tooth mobility and loss. Chronic periodontitis is a common disease characterized by a painless, slow progression. It may occur in most age groups, but is most prevalent among adults and seniors worldwide, with approximately 35% of adults (30–90 years) in the US being affected by at least one site with $CAL \geq 3$ mm and probing depth (PD) ≥ 4 mm.²

Chronic periodontitis has been defined as “an infectious disease resulting in inflammation within the supporting tissues of the teeth, progressive attachment loss and bone loss”.³ It is initiated by bacterial plaque, the pathogenesis of the disease is primarily affected

by local and systemic conditions that affect the resistance of the host to infecting periodontal organisms^{4,5} as well as by host defence mechanisms. Psychosocial factors like stress, anxiety and depression are emerging as risk element in various systemic diseases including chronic periodontitis. Many studies have found relationship between anxiety, depression and chronic periodontitis.^{6,7}

Stress is an equated response to constant adverse stimuli. At one point or another everybody suffers from stress. Stress is compatible with good health, being necessary to cope with the challenges of everyday life. Problems start when the stress response is inappropriate to the intensity of the challenge. Psychological stress can down regulate the cellular immune response. Communication between the central nervous system and the immune system occurs via a complex network of bidirectional signals linking the nervous, endocrine, and immune systems. Stress disrupts the homeostasis of this network, which in turn, alters immune function. Direct association between periodontal disease and stress remains to be proven, which is partly due to lack of an adequate

animal models and difficulty to quantifying the amount and duration of stress and also there are many factors influencing the incidence and severity of periodontal disease. Nevertheless, more recent studies indicate that psychosocial stress represents a risk indicator for periodontal disease and should be addressed before and during treatment.⁶

Hence, the present study was conducted to evaluate the association between anxiety and depression with chronic periodontitis.

MATERIAL AND METHODS

STUDY POPULATION DESIGN AND DATA COLLECTION

Overall, 100 subjects were enrolled in this study. The study population was divided into two groups; Group B/(Periodontitis group) consisted of sample having Clinical attachment loss of ≥ 3 mm in at least 30% site examined, and the samples that did not satisfy the above criteria were categorized into Group A.

ELIGIBILITY CRITERIA

The patients who were willing to enroll in the study were included in the study only after signing a written informed consent. Their demographic and socioeconomic data included age, sex, marital status, religion, residence, educational status, occupation, smoking habit and tooth brushing frequency. Patients of either sex with age above as well as those with at least 20 natural teeth within both jaws were included in the study.

Subjects who underwent periodontal therapy within past three months, those requiring antibiotic prophylaxis, those having diabetes mellitus, HIV infection, renal diseases, those taking any medications for any psychiatric diseases or those on anticonvulsant drugs or on drugs for hypertension or those under immunosuppressant therapy, were excluded from the study.

RESULTS

Table 1: Age-wise distribution of subjects.

Age group	Group A	Group B
25-34	45	05
35-44	10	03
45-54	03	25
>55	02	07
Total	60	40

Most of the subjects from group A belonged to the age group of 25-34 years. While in group B, majority of the subjects belonged to the age group of 45-54 years.

Table 2: Gender-wise distribution of subjects.

Gender	Group A	Group B
Males	40	30
Females	20	10
Total	60	40

There were 40 males and 20 females in group A while there were 30 males and 10 females in group B.

CLINICAL MEASUREMENTS

Dental plaque, gingival health, probing pocket depth (PPD), and clinical attachment loss (CAL) were all examined for periodontal disease. Using the Plaque Index (PI) and Gingival Index (GI), the presence of plaque and gingival health were noted. Using a UNC-15 probe (Hu-Friedy, IL, USA), the clinical periodontal examinations were performed manually. Four locations on each tooth (mesial-facial, midfacial, distal-facial, and palatal/lingual) were used to quantify the CA loss and probing pocket depth (PD). The PD was a measurement of the distance between the gingival margin and the periodontal pocket's base. The gingival sulcus or periodontal pockets base to the cemento-enamel junction was measured as the CA loss. Patients were given self-reporting questionnaires to complete after their clinical examinations in order to gather information on psychosocial factors including anxiety and depression.

PSYCHOSOCIAL MEASUREMENTS

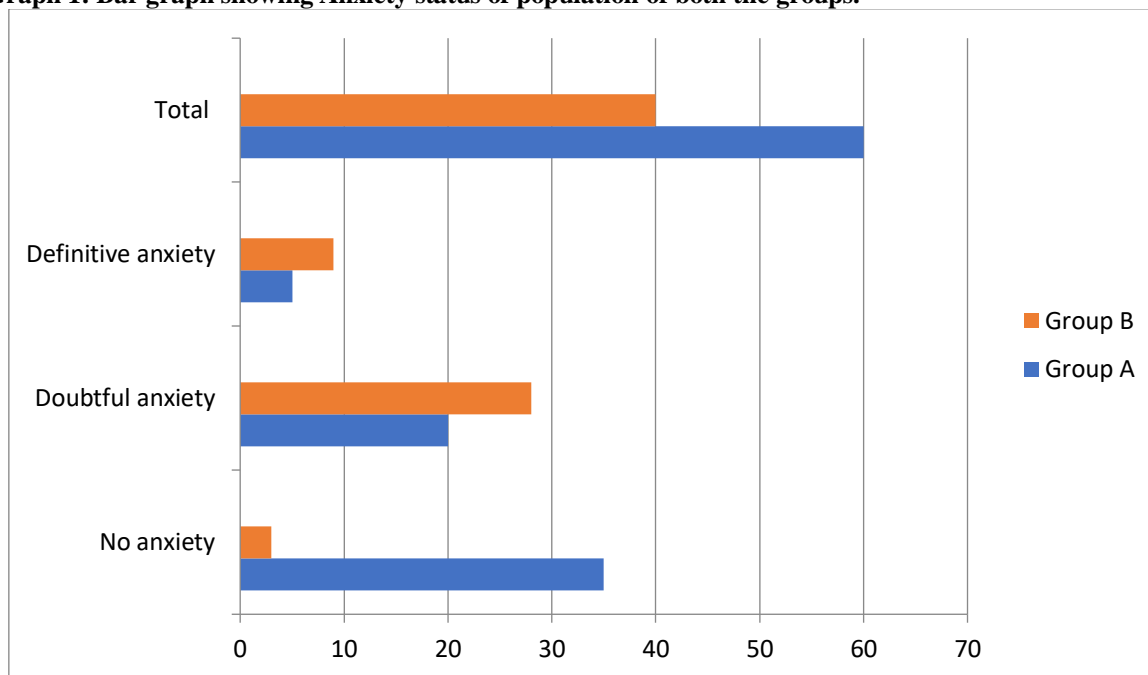
The Hospital Anxiety and Depression Scale (HADS) was the psychometric tool that was employed. The hospital Anxiety and Depression Scale (HADS) has been successfully used in a number of languages to evaluate anxiety and depression in patients admitted to general hospitals. Since its creation, the HADS has been extensively translated and used in more than 25 nations. The HADS was a 14-item, 4-point Linker scale (with a range of 0 to 3), self-reported rating scale. It was created to gauge depression and anxiety (7 items for each subscale). If the combined subscores for each depression/anxiety scale were less than 7, depression/anxiety was not present. If the total subscore was 8 to 10, there was question about the presence of anxiety or sadness. If the overall subscore was less than 11, then there was definitely despair or anxiety present.

Table 3: Anxiety status of two different groups of the population.

Anxiety status	Group A	Group B
No anxiety	35	03
Doubtful anxiety	20	28
Definitive anxiety	05	09
Total	60	40

Majority of the subjects from the first group had no anxiety while most of the subjects from the second group had doubtful anxiety.

Graph 1: Bar graph showing Anxiety status of population of both the groups.



The study also revealed that both plaque and gingival index scores were higher in the Periodontitis group compared to Group A. It was also revealed that smoking was significantly associated with periodontitis.

DISCUSSION

Periodontal diseases are opportunistic infections caused by specific periodonto-pathogens and their metabolic products. Epidemiological studies indicate several so-called risk factors and risk indicators that may be closely related to the emergence and progression of periodontitis. An increasing number of studies have shown that psychological stress or other psychosomatic conditions lead to immunological changes and/or behaviour-mediated effects which may have direct modulating effects on the immune system of the body.⁸

Stress is a complex term covering many variables and processes, such as number of major life events during the previous year, total and average perceived stress in relation to these events, daily hassles and anticipated future stressors. In addition, stress can involve depression and anxiety as reactions to stressors impinging on individuals.⁹

Tobacco nicotine and its byproducts have a vasoconstrictive effect, not only on peripheral circulation but also on coronary, placental, and gingival blood vessels as well.¹⁰

In this study, most of the subjects from group A belonged to the age group of 25-34 years. While in

group B, majority of the subjects belonged to the age group of 45-54 years. There were 40 males and 20 females in group A while there were 30 males and 10 females in group B. Majority of the subjects from the first group had no anxiety while most of the subjects from the second group had doubtful anxiety. It was revealed that both plaque and gingival index scores were higher in the Periodontitis group compared to Group A. It was also revealed that smoking was significantly associated with periodontitis.

Cross sectional studies with large number of population sample revealed significant association between psychosocial factors and periodontitis.^{11,12,13} Genco et al found that stress, revealed as financial strain, and depression were associated with greater levels of clinical attachment loss or higher levels of alveolar bone loss, independently measured but correlated measures of destructive periodontal disease.¹⁴

CONCLUSION

The level and prevalence of anxiety and depression were higher in more severe case of periodontitis compared to less severe case of periodontitis. Within the limit our study, there was significant association

between anxiety and depression with chronic periodontitis. Further prospective studies using biochemical markers would be reliable to clarify the role of psychosocial factors and their mechanisms of action in the periodontal tissues.

REFERENCES

1. Burt B. Position paper: Epidemiology of periodontal diseases. *J Periodontol.* 2005;76:1406–1409.
2. Page RC, Eke PI. Case definitions for use in population-based surveillance of periodontitis. *J Periodontol.* 2007;78:1387–1399.
3. Flemmig TF. Periodontitis. *Ann Periodontol.* 1999;4(1):32- 37.
4. Page RC, Kornman KS. The pathogenesis of human periodontitis: an introduction. *Periodontol* 2000. 1997;14:9- 11.
5. Genco RJ. Current view of risk factors for periodontal diseases. *J Periodontol.* 1996;67(10 Suppl):1041-1049.
6. Genco RJ, Ho AW, Grossi SG, Dunford RG, Tedesco LA. Relationship of stress, distress and inadequate coping behaviors to periodontal disease. *J Periodontol.* 1999;70 (7):711-723.
7. Ng SKS, Leung WK. A community study on the relationship of dental anxiety with oral health status and oral health-related quality of life. *Community Dent Oral Epidemiol.* 2008;36(4):347-356.
8. Breivik T, Thrane PS, Murison R, Gjerme P. Emotional stress effects on immunity, gingivitis and periodontitis. *Eur J Oral Sci.* 1996;104(4 (Pt 1)):327-334
9. Monteiro da Silva AM, Oakley DA, Newman HN, Nohl FS, Lloyd HM. Psychosocial factors and adult onset rapidly progressive periodontitis. *J Clin Periodontol.* 1996;23 (8):789-794. PMID: 8877667.
10. Gonzalez YM, De Nardin A, Grossi SG, Machtei EE, Genco RJ, De Nardin E. Serum Cotinine Levels, Smoking, and Periodontal Attachment Loss. *J Dent Res.* 1996;75 (2):796-802.
11. Genco RJ, Ho AW, Grossi SG, Dunford RG, Tedesco LA. Relationship of stress, distress and inadequate coping behaviors to periodontal disease. *J Periodontol.* 1999;70 (7):711-723.
12. Ng SKS, Leung WK. A community study on the relationship of dental anxiety with oral health status and oral health-related quality of life. *Community Dent Oral Epidemiol.* 2008;36(4):347-356.
13. Chiou L-J, Yang Y-H, Hung H-C, et al. The association of psychosocial factors and smoking with periodontal health in a community population. *J Periodontal Res.* 2010;45 (1):16-22.
14. Genco RJ, Ho AW, Grossi SG, Dunford RG, Tedesco LA. Relationship of stress, distress and inadequate coping behaviors to periodontal disease. *J Periodontol.* 1999;70 (7):711-723.