

Assessment of Depression, Anxiety and Stress Symptoms among Patients with Periodontal Disease

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Abstract

The main objectives of the study are to assess the rate and severity of depression, anxiety and stress symptoms and to identify the possible association between these emotional disturbances with periodontal disease.

This is a cross sectional study conducted on a sample of 159 patients with periodontal disease attending the periodontal clinic, Kulliyah of Dentistry, International Islamic University Malaysia. The prevalence and severity of depressive, anxiety and stress symptoms were assessed among those patients by using the self-rating Bahasa Malaysia version of the Depression Anxiety and Stress Scale (DASS-21).

The overall rate of depression, anxiety, and stress among patients was 18.9%, 36.5% and 19.5% respectively. Regarding the severity of the symptoms, it was found that 3.8%, 6.3 % and 2.5% of the patients had clinically significant depression, anxiety and stress respectively. Although patients with periodontitis had higher mean scores of depression, anxiety and stress than those with gingivitis but it was not statistically significant.

Emotional disturbances in the form of depression, anxiety and stress are existing in high rates among patients with periodontal problem that require early detection and intervention.

Clinical article (J Int Dent Med Res 2017; 10(2): pp. 260-264)

Keywords: Depression, Anxiety, stress, periodontitis, gingivitis.

Received date: 14 April 2017

Accept date: 16 May 2017

Introduction

Although oral pathologies are limited to the oral cavity, however they can affect the patient in a broader aspect in regards to the symptoms they bring such as pain and the effect of these oral conditions on the normal lifestyle of the patient such as inability to eat certain types of food or the need for the use of certain oral health procedures and the commitment to multiple dental appointments for treatment.

Gingivitis is one of the most commonly seen diseases in humans. It involves the inflammation of only the gingiva it is a non-destructive inflammatory condition that is mainly caused by bacterial biofilms that are attached to

the tooth surface. Gingivitis is reversible with good oral hygiene; however, without treatment, gingivitis can progress to periodontitis¹

Periodontitis is a common chronic oral pathology characterized by inflammatory changes of the tissues surrounding the teeth. It is progressive in nature and gradually leads to loss of the alveolar bone around the teeth, and if left untreated, can lead to the loosening and subsequent loss of teeth.²

The local destruction of periodontitis is believed to result from a bacterial infection of the gingival sulcus.³ caused by microorganisms that adhere to and grow on the tooth's surfaces, along with an over-aggressive immune response against these microorganisms^{4,5}

Periodontitis causes a variety of symptoms ranging from redness, bleeding and swelling of the gum, pain, bad breath and metallic taste.⁶

Depression is defined by the American Psychiatric Association in the Diagnostic and Statistical Manual of Mental Disorders–5 (DSM-5) as a disorder that is characterized by either a

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depressed mood or markedly diminished pleasure in all activities in addition to at least four other symptoms within a duration of at least two weeks, these symptoms include, significant weight loss/weight gain, disturbed sleep, diminished concentration, fatigability, psychomotor agitation or retardation, feeling of worthlessness or inappropriate guilt, thoughts of death or recurrent suicidal ideation.⁷ Anxiety is a condition that is characterized by intense feeling of dread, accompanied by somatic symptoms that indicate a hyperactive autonomic nervous system, also it impairs cognition and may produce distortions of perception.⁸ Stress can be defined as the physiological and psychological response to events that are appraised as threatening or challenging that require adjustment⁹

The aims of this research is to determine the prevalence and severity of depression, anxiety and stress among patients with gingivitis and periodontitis.

Materials and methods

This is a case control study conducted on patients attending the Kulliyyah of Dentistry periodontics clinic, International Islamic University Malaysia. A total of 159 patients attending the Periodontal Clinic were selected purposively depending on the inclusion and the exclusion criteria.

Inclusion criteria:

Male and female patient who are above 18 years of age and have been diagnosed with periodontal disease (gingivitis or periodontitis) and who have not taken any antibiotic treatment for the past one month

Exclusion criteria

The following patients were excluded; Pregnant, smoker, having other systemic illness

Ethical approval and consent

Ethical approval number (IREC 250) was obtained from the IIUM Research Ethics Committee prior to commencing the study. All patients were informed verbally and were given the patient information sheet to explain about the purpose of the study. A written informed consent was obtained from the patient after explaining the details of clinical procedures prior to participation. The patients were asked to fill the patient's data form that was provided. The data includes gender, age, race, level of education, income per

month.

Clinical examination

All patients underwent a full-mouth clinical examination by a periodontics specialist at six sites per tooth (third molars excluded), using a manual periodontal probe. The periodontal parameters included probing depth (PD), Clinical attachment loss (CAL) and bleeding on probing (BOP)

The emotional disturbances were assessed by using the Depression Anxiety, Stress Scale (DASS-21) which is a short version, self-rated questionnaire that is designed to assess the severity of the symptoms of depression, anxiety and stress; it consists of statements referring to the past week. Each item is scored on a 4-point scale (0 = Did not apply to me at all, 1= Applied to me to some degree, or some of the time, 2=Applied to me to a considerable degree, or a good part of time, and 3 = Applied to me very much or most of the time).¹⁰ We used the Malay version of DASS-21 which has been translated and validated by Musa et al¹¹. Subjects were asked to use 4-point severity/frequency scales to rate the extent to which they have experienced each state over the past week. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items. Each subscale was categorized into normal, mild, moderate, severe and extremely severe. In this study, we further classified those who have severe and extremely severe symptoms as 'clinically significant' and those with mild and moderate as 'subclinical'.

Statistical Analysis

All the data obtained from the study were processed and analyzed by means of statistical package for social science version 22.0 (SPSS ver.22.0). The analysis for the sociodemographic data were presented in numbers and percentages, the mean scores were used to determine the presence of emotional disturbances. Mann-Whitney U test and Kruskal-Wallis test were used to determine the association between the important sociodemographic characteristics with the emotional disturbances. A p value of less than 0.05 was considered as statistically significant.

Results

A total of 159 patients with periodontal disease participated in this study. The males

were slightly more than females (51.6%). The majority of patients were Malay (71.7%), married (82.4%) and fall in the age group of 41-60 years (56.6%). Regarding the diagnosis of periodontal disease, 73% of the patients were diagnosed with periodontitis while 27% were having gingivitis.

The overall prevalence of depression, anxiety and stress symptoms among patients with periodontal disease was 18.9%, 36.5% and 19.5% respectively. Regarding the severity of these symptoms, the rates of clinically significant depression, anxiety and stress were 3.8%, 6.3% and 2.5% respectively (Table.1)

	Depressio n (N %)	Anxiety (N %)	Stress (N %)
Subclinical	24 (15.1)	48 (30.2)	27 (17.0)
Clinically significant	6 (3.8)	10 (6.3)	4 (2.5)
Total No. of affected Patients	30 (18.9)	58(36.5)	31(19.5)

Table1. Prevalence of Depression, anxiety and stress symptoms among patients attending periodontal clinic.

	Total no. & (percentage)	Mean depression level	P Value	Mean Anxiety level	P value	Mean stress level	P value
Periodontal diseases							
Periodontitis	116 (73)	4.65	0.415	6.18	0.889	7.95	0.453
Gingivitis	43 (27)	3.76		6.04		6.97	
Gender							
Male	82 (51.6)	4.37	0.937	6.00	0.755	7.40	0.607
Female	77 (48.4)	4.45		6.31		8.0000	
Race							
Malay	114 (71.7)	4.30	0.722	6.50	0.254	7.92	0.514
Non-Malay	45 (28.3)	4.68		5.24		7.08	
Marital status							
Married	131 (82.4)	4.44	0.902	6.29	0.547	7.96	0.300
Unmarried	28 (17.6)	4.28		5.50		6.39	
Age (years)							
18-40	42 (26.4)	3.33	0.566	5.33	0.669	6.07	0.307
41-60	90 (56.6)	4.75		6.84		8.71	
>61	27 (17.0)	4.96		5.11		6.81	

Table2. Factors Determine Significant Depressive, Anxiety and Stress Levels

In assessing the factors that may determine significant depression, anxiety and stress symptoms, patients with periodontitis have higher mean scores in depression, anxiety and stress than those with gingivitis; however it is not statistically significant. Among the

sociodemographic factors there was no difference in mean score of depression, anxiety and stress with gender, race and marital status. Patients in the age group of 18-40 years showed lower mean score of emotional disturbances than older patients (Table 2).

In assessing the effect of emotional disturbances on the severity of periodontitis, patients with advanced periodontitis showed higher mean scores of emotional disturbances in the form of depression, anxiety and stress symptoms, although it was not statistically significant (Table 3).

	Mean Depression	P value	Mean Anxiety	P value	Mean Stress	P value
Mild periodontitis	3.7	0.59	5.3	0.63	6.9	0.62
Advanced periodontitis	4.7		6.2		8.0	

Table 3. The effect of emotional disturbances on the severity of periodontitis.

Discussion

The prevalence of depression in our study was found to be higher than that in primary care setting where it was found to be 6.7-14.4%.^{12,13} It is also higher than the rate of depression in the general population in Malaysia where the rate was found to be 10.3%.¹⁴

Regarding anxiety, our finding is much higher than the rate in the general population in Malaysia as it was reported to be 8.2%.¹⁵ The prevalence of stress in our study was also higher than the general population, as a study done in 2006 among Malaysian population to assess the psychological distress found it to be 11.2%.¹⁶

This means that patients with periodontal disease are more subjected to have higher rates of emotional disturbances.

Patients with periodontitis showed higher mean scores of emotional disturbances than gingivitis cases. This may be explained by the fact that gingivitis is a less aggressive and is not destructive in nature. It produces less symptoms than periodontitis and its treatment is easier and of shorter duration¹. Whilst for periodontitis, it is considered as a chronic inflammatory condition where the inflammatory response is characterized by dysregulated secretion of inflammatory mediators and tissue breakdown. The most extensively studied mediators include IL-1 β , IL-6, prostaglandin E2, TNF- α , and the matrix metalloproteinases, as well as T cell regulatory cytokines (e.g. IL-12, IL-18) and the chemokines.^{17,18}

Stress interferes with the host defenses, exerting an immunosuppressive effect, increasing one's vulnerability to disease.^{19,20} Cytokines and other mediators of inflammation are potent activators of the central stress response, and the glucocorticoids released via this mechanism might regulate the recruitment of immune cells into inflamed tissues, in order to cope with the psychological stress and depression. When the inflammatory action is sufficiently long and profound, the systemic manifestations of the disease may become evident, as could happen with periodontitis.²¹

This can be demonstrated in our results by higher mean scores of depression, anxiety and stress in patients with advanced periodontitis than mild periodontitis

Previous studies have found that stress plays an important factor in the etiology and maintenance of inflammatory conditions like the periodontal diseases.²² Psychosocial factors and oral health risk behaviors cluster together as important determinants of periodontitis, also the chronic job and financial strains, depression, inadequate coping, and maladaptive trait dispositions are significant risk indicators for periodontal attachment loss.²³

Depressive mood can be a predisposing factor to the progression of periodontitis which might be due to the fact that depressed patients neglect oral hygiene and regular dental check-ups as a result of reduced drive, mood, affectivity and interest.²⁴ Previous studies have revealed, the relation between depressive mood and periodontitis which has been attributed to an impaired immune response caused by a disturbance in the hypothalamo-pituitary-adrenocortical (HPA) system.²⁵ This impairment of immunological defence mechanisms might result in an accumulation of pathogens leading to progression of periodontitis.

The findings from this study showed that patients with periodontitis have higher mean scores for anxiety symptoms than patients with gingivitis. Furthermore, patients with advanced periodontitis are having higher anxiety scores than mild periodontitis. Previous studies have also reported that patients with higher levels of anxiety are more prone to severe periodontitis.^{26,27}

Conclusions

Emotional disturbances in the form of depression, anxiety and stress are existing in high rates among patients with periodontal problem that require early detection and intervention by the means of using reliable and validated questionnaires like DAS-21 and referring patients with abnormal findings for further psychiatric intervention.

Acknowledgements

We would like to express our appreciation to the International Islamic University Malaysia for funding this research. We would also like to thank the staff of the periodontic clinic, Kulliyah of Dentistry for facilitating our study.

Declaration of Interest

The authors report no conflict of interest.

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