



Relationship Between Periodontitis and Depression - A Crucial Link. A Case Report

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Abstract

Periodontitis is one of the most common chronic inflammatory disease and is influenced by various other factors. Stress and other psychological/ emotional disorders play a role in the progression of periodontal disease because of their impact on the immune response of the host. Clinical depression can also adversely affect periodontal treatment outcomes. Antidepressants, such as selective serotonin reuptake inhibitor (SSRI), also have been found to have an influence on the severity of periodontal disease. This case report aims to describe the effects of depression and antipsychotic drugs on periodontitis and report a case of rapid bone destruction seen in a patient diagnosed with depression and under SSRI medication.

Introduction:

Periodontitis with a multifactorial etiology is one of the most common chronic inflammatory disease. Plaque and the host response to microorganisms in the plaque has been identified as the major etiology in periodontitis. Periodontitis is also influenced by various other factors like smoking, poor oral hygiene, systemic diseases like cardiovascular disease, respiratory disease, diabetes mellitus etc. It has been identified that stress and other psychological/emotional disorders also play a role in the progression of periodontal disease because of their impact on the immune response of the host. Depression is defined as pervasive, protracted periods of despondency (low spirit), feeling of meaninglessness, and a sense of hopelessness and it is one of the major etiological factors for disability, low performance and poor mental health all over the world.¹

Large amount of clinical research and animal studies point towards the relationship between periodontitis and depression. Research also shows that clinical depression can adversely affect periodontal treatment outcomes. This is supported by other studies whose results show that psychosocial factors have a major influence on both surgical outcome, as well as postoperative recovery.²

Antidepressants, such as selective serotonin reuptake inhibitor (SSRI), have an influence on the severity of periodontal disease and has been shown in both rat models, as well as in periodontitis patients with clinical depression.²

This case report aims to describe the effects of depression and antipsychotic drugs on periodontitis and report a case of rapid bone destruction seen in a patient diagnosed with depression and under SSRI medication.

Case report:

A 32 year old male patient reported to the department of Periodontics and Oral Implantology, AME's Dental College and Hospital, Raichur with the chief complaint of discolouration of teeth since 3 years. Initial general examination revealed normal gait and posture with grossly symmetrical face, no lymphadenopathy or TMJ disorders. Patient reported of brushing once daily with brush and toothpaste since childhood and uses no other oral hygiene aids. Patient follows a mixed diet and reports of no adverse habits.

This was patient's second dental visit and his first visit was 3 years back where he was diagnosed with mild generalized chronic periodontitis and had undergone scaling. Patient reported of history of depression and has been under medication for the same since 5 years.

Intra oral examination revealed good oral hygiene with a healthy gingiva with no inflammation or recession OPG revealed severe bone loss with generalised vertical bone loss. More than 50% radiographic bone loss was appreciated in almost all the teeth.

On comparison of the present OPG with the one taken in the 1st visit, rapid generalized bone loss was seen over a period of 3 years. There was increased destruction i.r.t lower left premolar region. On detailed anamnesis, patient revealed that he obtained a sense of pleasure on digging i.r.t to the lower premolars with pins and has been doing this for the past 2 years.

Medical reports of the patient revealed that patient has been on antidepressant drug Estomine (selective serotonin reuptake inhibitor) since 5 years and is presently on a tapered dose. Patient reported of a possible positive family history of depression with regards to his father but the patient's father had not taken any medical consultation for the same. Patient lost both his parents recently and reports that the trauma has worsened his medical condition.

Discussion:

Progression of periodontitis is affected by many factors. The immune response of the host plays a significant role. Depression and other emotional disorders influences the immune response of the host and has been identified as a risk factor for periodontitis.¹ The new classification of periodontal disease also recognizes emotional disorders such as depression as a systemic disease that affects the pathogenesis of periodontitis.³

Depression exerts an impact on the host through many different mechanisms. Social determinants such as older age, socioeconomic status, low education, unhealthy lifestyles, and genetic factors such as polymorphisms of brain derived neurotropic factor (BDNF) and serotonin act as common contributing factors for both periodontitis and depression²

In the present case report, patient has been diagnosed with depression and has been under anti-depressants, SSRI (Estomine) since 5 years. Over a 3 year period there is rapid generalised bone destruction as shown by the 2 OPGs taken in the 1st and 2nd visit. There is excessive vertical bone loss seen in 34, 35 region which might be attributed to the patient's adverse habit of digging in that region with pins which could be an outcome of his psychological condition.

Patient's oral hygiene status is fairly adequate and not consistent with the destruction seen thus point towards other factors which might be influencing the rapid periodontal destruction.

Fatima et al in 2016,¹ conducted a case control study where she concluded that depression significantly affects the periodontium and should be considered as a risk factor for periodontitis. Although a systematic review and meta-analysis conducted by Araujo et al in 2016,⁴ couldn't affirm an association between depression and periodontitis, later another meta-analysis conducted by Liu et al in 2018,⁵ demonstrated significant association between chronic periodontitis and emotional disorders like anxiety and depression.

Thus it can be implicated that depression might have influenced the rapid progression of periodontitis in this present case report. Along with the impact of depression on periodontitis, the anti-depressant drugs that the patient has been having for 5 years might have also played a role in the rapid destruction seen.

Tricyclic anti-depressants (TCA), selective serotonin reuptake inhibitors (SSRI), monoamine oxidase inhibitors and atypical antidepressants are the medications commonly prescribed against depression.⁶ Studies have shown that some of these drugs also to be risk factors for periodontal health. In the present case report, patient has been on anti-depressant medications, SSRI for 5 years. Bey et al in 2020,⁷ conducted a case control study to assess the effect of commonly prescribed anti-depressants (selective serotonin reuptake inhibitors and serotonin-norepinephrine reuptake inhibitors) on periodontium and he concluded that these drugs did not exert any protective role on periodontium despite their anti-inflammatory property but instead may be considered as risk factors in periodontal health. They also suggested that patients on anti-depressants should be put on regular recall visits to maintain their periodontal health.

X Wu et al in 2014,⁸ conducted a cohort study which showed an increased risk of failure of osseointegrated implants in SSRI users compared to controls. Their results showed that SSRIs might prevent the bone-remodelling processes stimulated by mechanical loading, leading to loss of bone mass and thus affecting the longevity of functional implants.

Krishnan and Nestler in 2008, has reported that Serotonin (5-hydroxytryptamine [5-HT]), a monoamine neurotransmitter in the brain is responsible for providing feelings of happiness and can result in depression if there is a fall in the level of this hormone. Serotonin reuptake inhibitors (SSRIs) one of the most widely used antidepressants, such as Lexapro, Celexa, Prozac, Paxil, and Zoloft selectively inhibit serotonin reuptake, boosting its levels and is thus an effective aid in the treatment of depression.⁸

Serotonin receptors can also be found in various other tissues such as the platelets, digestive tract, and bones and thus serotonin and SSRIs can affect the function of the cardiovascular, digestive and skeletal systems (Tsapakis et al., 2012). Complex signal transmissions in osteoblasts and osteoclasts are initiated by serotonin receptors such as serotonin transporters (5-HTTs) and 5-HT1B, 5-HT2B, 5-HT2C receptors.⁸

SSRIs cause reduction in bone mass by blocking 5-HTTs which has an inhibitory effect on the proliferation of osteoblasts while stimulating osteoclast differentiations. Thus, SSRIs are shown to cause an annual reduction rate of 0.60% to 0.93% in bone mass and density which makes the patient susceptible to osteoporosis and osteoporotic fracture.⁸

This case report describes the combined effect of depression and anti-depressant drugs on the progression of periodontitis. Along with this the deleterious habit of digging the gums, which might be an outcome of the psychological status of the patient might also have played a significant role in the rapid alveolar bone loss.

Conclusion:

The multifactorial etiology of periodontitis has been well accepted. The psychological status has an impact on both the physiology as well as the behavioural pattern of an individual. In the recent times there has been much effort being put into spreading awareness about depression and its far reaching effects, as well as to combat the stigma associated with it. This case report highlights the impact of depression on periodontal health and also the effect of antidepressant drugs on periodontium. With increasing recognition of the importance of mental health and the high prevalence of emotional disorders among the population its

important for us as dentists to have an in-depth knowledge about the effects that psychological factors and the associated medications have on the oral health and in particular on periodontal health.

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