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STRESS RELATED ORAL DISORDERS: AN UPDATE

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ABSTRACT: Oral changes with psychosomatic etiology are still an insufficiently confirmed and investigated subgroup of psychosomatic diseases which have long been known in medicine. In their daily practice dentists frequently come across patients showing signs of stress and their oral manifestations in form of recurrent oral stomatitis, oral lichen planus and temporomandibular disorders. Recognition of such psychological or emotional disturbance benefits both the patient and clinician. Hence psychological management should be taken into consideration when treating patients with these psychosomatic disorders.

KEYWORDS: **Stress, RAS, OLP, TMD, Oral disorders, Apthous, Llichen planus, Temporomandibular disorders**

INTRODUCTION

A psychosomatic disorder involves both body and mind. These diseases have physical symptoms originating from mental or emotional causes. Most common ones are stress, anxiety and depression. A wide spectrum of psychiatric disorders affects oral and para-oral structures which have a definite psychosomatic cause, but unfortunately they remain unrecognized because of the common and limited nature of their presenting features. Emotional and psychological factors can disturb a wide variety of hormonal, vascular and muscular functions, all of which may produce peripheral changes varying from pain, disturbance in jaw movement, xerostomia and ulcerations. Oral cavity is directly or symbolically related to major human instincts and passions. Oral diseases with psychosomatic etiology have long been known in medicine and mental or emotional factors may act as risk factor that could influence the initiation and progression of oral disorders. Oral psychosomatic disorders include: Oral lichen planus (OLP), recurrent apthous stomatitis (RAS), Erythema multiforme (EM) and mucous membrane pemphigoid (MMP), Necrotizing Gingivitis, burning mouth syndrome, temporo-mandibular disorders (TMD) and atypical facial pain. Most common oral disorders which can be attributed to stress are OLP, RAS and TMD.

Review of the Literature

The causal relationship between stress and oral disorders has been explored in the past. Richter et al 2003 [1] have studied the possible connection of oral diseases like Aphthae stomatitis, Lichen planus, symptoms of xerostomia and stomatopyrosis, and oral parafunction, bruxism and dysgeusia with different intensities of psychological characteristics of self-esteem, anxiety and neuroticism in a sample of 227 inhabitants from the Gorski Kotar area and found positive correlation between the occurrence of xerostomia, stomatopyrosis, recurring aphthae and bruxism in relation to the occurrence of anxiety, and stomatopyrosis and xerostomia with neuroticism. The study by Soto-Araya M, et al 2004 [2] aimed to determine the existing relation between the Oral Lichen Planus (OLP), Recurrent Aphthous Stomatitis (RAS), Burning Mouth Syndrome (BMS) and psychological alterations of the patient, such as stress, anxiety and depression. The results of this study suggested a statistically significant association between these psychological disorders and the diseases of the oral mucosa. It was observed that the stress level was greater in patients with RAS and OLP, depression was particularly high in patients with BMS, and levels of anxiety were more in the three groups, in comparison with the group control. The research study by Maheswari et al [3] aimed to identify the role of stress as one of the etiological factor in oral lesions such as Oral lichen planus, Apthous ulcers, Burning mouth syndrome and Myofacial pain Dysfunction syndrome and found definite association of stress in some of the clinical subjects in all these groups. In a study by Gavic L et al in 2014 [4], 110 patients with RAS in the acute phase and 112 patients with OLP also in acute phase were studied using psychological tests: Beck Depression Inventory (BDI), The State-Trait Anxiety Inventory (STAI), and Ways of Coping Questionnaire (WCQ). In this study, a high correlation between anxiety, depression, and psychological stress with symptoms of RAS and OLP has been observed.

Evaskus and Laskin in 1972 [5] showed that patients with myofascial pain-dysfunction syndrome are under greater emotional stress than control individuals by measurement of urinary catecholamine and 17-hydroxy steroid levels.

Camila de Barros Gallo et al (2009) [6] found a higher level of psychological stress among RAS group patients when compared to the control group and concluded that psychological stress may play a role in the manifestation of RAS; it may serve as a trigger or a modifying factor rather than being a cause of the disease.

Koray M et al in 2003 [7] determined association between anxiety and salivary cortisol levels in oral lichen planus (OLP) patients by the case-control method. This group found that salivary cortisol, state and trait anxiety levels in OLP group were significantly higher than in the control group. In a study by Vallejo MJ et al in 2001 [8] eighty patients diagnosed as having OLP were studied using Hamilton Anxiety Scale and Montgomery-Asberg Depression Rating Scale. Significantly greater anxiety and depression were observed among patients with OLP than in the control group. Odds ratios of 2.8 and 4.4 were obtained for anxiety and depression, respectively. Sandhu et al in 2014 [9] studied the existing relation between the OLP and psychological alterations of the patient, such as stress, anxiety, and depression using Hospital anxiety and depression scale. The study indicated a definitive relationship between a stressful life event and onset and progression of OLP.

Common oral psychosomatic disorders

Oral lichen planus

Oral lichen planus (OLP) is an immmunologically mediated mucocutaneous disorder. Skin lesions are classically described as purple, pruritic, polygonal papules usually affecting the flexor surface of extremities. Oral lesions can present as reticular, erosive, atrophic, plaque-like, papular or bullous type. Reticular lichen planus is common and it involves the buccal mucosa, lateral and dorsal tongue, gingiva, palate and vermilion border **(Fig.1 1).**

Typical radiating white striae and erythematous atrophic mucosa are present at the periphery of well-demarcated ulcerations on the posterior buccal mucosa. The etiology of the disease is unknown but at present it has been linked to autoimmune disorder. Some authors state that it is a psychosomatic disorder caused by anxiety or stress [10]. A retrospective study of 420 Iranian patients also reported that stress was one of the factors in at least 50% of patients [11]. A substantial body of evidence supports the concept that emotional stress is a major etiologic factor in these diseases. The principal aims of current OLP therapy are the resolution of painful symptoms, oral mucosal lesions, the reduction of the risk of oral cancer, and the maintenance of good oral hygiene. Eliminating the exacerbating factors as preventive measures is the recommended approach for managing this condition. Up to now different therapies are described for OLP including drug therapy, surgery, psoralen with ultraviolet light A (PUVA), and laser. Relaxation, meditation and hypnosis have positive impact on many cutaneous diseases and help to calm and rebalance the inflammatory response which can ameliorate inflammatory skin disorders

Recurrent apthous stomatitis

Recurrent apthous stomatitis (RAS) is a common condition characterized by the presence of recurring oval or round ulcerative lesions affecting oral mucosa **(Fig.2).** It is one of the most painful oral mucosal inflammatory ulcerative conditions. The etiology is multi-factorial with evidence of immunological changes provoked by various predisposing factors like stress, trauma, food, hormonal imbalance and smoking [12]. In RAS, a psychoanalytic etiology is evident in many cases. Previous literature shows successful treatment response of RAS with positive psychological approach [2]. It has been proposed that stress may induce trauma to oral soft tissues by para-functional habits such as lip or cheek biting and this trauma may predispose to ulceration. A more recent study shows stressful life events were significantly associated with the onset of RAS episodes but not with the duration of the RAS episodes. [13]. There is no definitive curative treatment for RAS. Treatment strategies must be directed toward providing symptomatic relief by reducing pain, increasing the duration of ulcer-free periods, and accelerating ulcer healing.

Temporomandibular disorders

Collectively, patho-anatomical dysfunctions of the TMJ have been defined as temporomandibular disorders (TMD). Temporomandibular pain has a musculoskeletal origin because it occurs as a consequence of masticatory muscle function disorder and temporomandibular joint (TMJ) disorder. TMD-associated pain is the third most prevalent chronic pain condition worldwide, after tension headaches and back pain [14]. Most common diagnoses of TMD are disc displacement, myofascial pain and osteoarthritis, but their comorbidity can also occur. Pain is the most common symptom, where chronic temporomandibular pain may contribute to the occurrence of psychological disorders in the patient population. Appropriate management of TMD requires an understanding of the underlying dysfunction associated with the TMJ and surrounding structures. Patient education is a central component of TMD management [15-17]. Each patient should receive individualized education. Primary areas of focus include reducing parafunctional habits, addressing psychosocial factors, and providing pain science education. Relevant psychosocial factors may include both anxiety and stress management. A number of works proved the existence of an association between TMD and anxiety, depression and

Fig.1. **Oral lichen planus presenting as Desquamative gingivitis**

stress, but none demonstrated causality of that relation[18]. In consideration of that, debates are still open to discuss the possible predisposing, triggering and/or worsening role played by some psychic disorders in TMD subjects.

Evaluation of patients with stress related oral disorders

The current approaches to measure stress include Self report of stress (for eg., Perceived stress scale – questionnaire with questions designed to provide information about how unpredictable, uncontrollable and overloaded the respondents felt their lives to be) [19] and Measures of affect (for eg., Profile of moods state; POMS questionnaire – assesses transient, fluctuating affective mood states. Consists of 6 identifiable affective states which are rated by the subjects on a 5 point scale) [20] Measures of stressor exposure (for eg., Major life events stress scale) [21] and lastly the stress biomarkers (for eg., Cortisol, C-Reactive protein and interleukins), or using a composite set of parameters (Allostatic load model) [22] which measure either the stressor or the stress response. The stress biomarkers commonly researched include:

- Metabolic markers – S. cholesterol, high-density lipoprotein (HDL) cholesterol, Total cholesterol-HDL ratio, S. Albumin, Glycosylated hemoglobin
- Immunological markers – Interleukin-6 (IL-6), Tumor necrosis factor (TNF-α), C-Rreactive protein (CRP), Insulin-like growth factor (IGF-1)
- Neuro-endocrine markers – Cortisol, Dehydroepiandrosterone (DHEA), and cortisol-DHEA ratio, adrenaline, noradrenaline, dopamine and aldosterone.
- Other parameters: Systolic blood pressure, diastolic blood pressure and waist:hip

Promise for the future

Ultrastucture of mitochondria of masticatory muscles was recently shown to be altered under chronic stress in rats. Swollen mitochondria with cristae loss and reduced matrix density were observed after 3 weeks of stimulation and after 5 weeks, severe vacuolar changes were observed by TEM. Anaerobic metabolism was also increased [23]. Oxidative stress is also known to cause reduced matrix density and disorganization of cristae, but in a reversible manner [24]. The fragmentation of mitochondria that is observed under chronic stress is due to unbalanced fission [25]. Markers of fission (Fis1) and fusion (DLP1, Mfn1, Mfn2, etc) [26] can be measured and if fission proteins are elevated and fusion proteins are decreased, the changes can be attributed to pathophysiology of chronic stress. A buccal swab can give enough cells to observe mitochondrial changes and the morphological changes of mitochondria could be used as biomarkers for chronic stress. Buccal swab collection is noninvasive and inexpensive, making ultrasturcture changes in mitochondria easy to use for large epidemiological studies. The intensity of ultrastructure integrity loss can be related to the length of time under stress.

Management of oral psycho-somatic disorders

Management of psychological component of stress related oral disorders relies mainly on two therapeutic modalities – Pharmacologic management and stress relaxation training. Under the pharmacological management, the dental practitioner may advise anti-anxiety, anti-depressants and sedatives/hypnotics. Stress

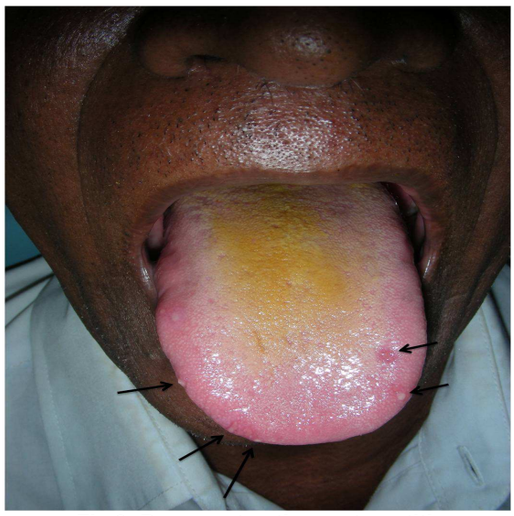

Fig.2. Recurrent apthous stomatitis

relaxation techniques include - yoga or meditation, Hypnosis, Biofeedback and Cognitive-behavioral therapy. The modern medical system has replaced almost all the traditional systems of medicine in different parts of this globe because of its rational basis. However, rapidly increasing incidence of stress related ailments is posing a great challenge to the modern medical system. It is here that stress relaxation techniques appears to make a vital contribution to the modern medical system. Several studies reported beneficial effects of yoga on anxiety, stress reduction and general well-being [27-29]. Thorough review of the literature revealed a systematic review and meta-analysis (Zhang Yet al 2015 [30]) of randomized controlled trials to evaluate the effectiveness of hypnosis/relaxation therapy compared to no/minimal treatment in patients with TMD. Three RCTs [31-33] eligible for the systematic review suggested that hypnosis/relaxation therapy may have a beneficial effect on maximal pain and active maximal mouth opening but not on pain and pressure pain threshold. D Sharan et al in 2014 [34] did a pilot study on 8 patients to study the effect of yoga on the Myofascial Pain Syndrome of neck and found significant improvement in the outcome measures in their study.

CONCLUSION

In their daily practice dentists frequently come across patients showing signs of stress and their oral manifestations in form of RAS, OLP and TMD. Recognition of such psychological or emotional disturbance benefits both the patient and clinician. Hence psychological management should be taken into consideration when treating patients with these psychosomatic disorders.

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