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Oral and Systemic Health during Menopause - A Systematic Review.

Hemalatha VT^{1*}, Julius A², Manisundar N³, Sarumathi T¹, and Aarthinisha V¹.

¹Department of Oral Medicine & Radiology, Sree Balaji Dental College & Hospital, Bharath University, Chennai, Tamil Nadu, India.

²Department of Biochemistry, Sree Balaji Dental College & Hospital, Bharath University, Chennai, Tamil Nadu, India.

³Department of Periodontia, Sree Balaji Dental College & Hospital, Bharath University, Chennai, Tamil Nadu, India.

ABSTRACT

Natural menopause is defined as a spontaneous cessation of natural menstruation for 12 consecutive months at 45-55 years of age. In a woman's life at middle age, during the climacteric process, circulating sex hormone levels change and this understandably results in some clinical effects, i.e. climacteric symptoms, which also affect the quality of life. The principal peri- and postmenopausal oral symptoms are dry mouth, sensation of painful mouth (PM) due to various causes and less frequently burning mouth syndrome (BMS). Other symptoms which are commonly linked to the climacteric stage are mood swings, urogenital dryness, tiredness, joint and muscle pains, dizziness, irritability and insomnia. This paper highlights on various systemic and oral changes occurring during menopause.

Keywords: Menopause, Xerostomia, Burning Mouth Syndrome, Osteoporosis.

**Corresponding author*

INTRODUCTION

Menopause is a physiological process which typically occurs in the fifth decade of life in women, and involves permanent cessation of menstruation. Many physiological changes, most of which are due to decreased ovarian estrogen production, take place in women approaching the menopause [1]. Women appear to experience an increase in oral symptoms that may result from endocrine disturbances (reduced estrogen), calcium and vitamin deficiency and various psychologic factors during menopausal years 1-3. They may complain of dry mouth because of decreased salivary secretion, as well as burning sensation of the mouth and tongue. Taste sensation may change, causing a frequent complaint of metallic taste [2].

World Health Organisation (WHO) has defined three age stages of midlife age for women (Research on the menopause. WHO 2002 "1) Menopause is the year of the final physiologic menstrual period retrospectively designated as 1 year without flow (unrelated to pregnancy or therapy) in women aged ≥ 40 years. 2) Premenopause begins at ages 35 to 39 years; during this stage, decreased fertility and fecundity appear as the first manifestations of ovarian follicle depletion and dysfunction, despite the absence of menstrual changes. 3) Perimenopause includes the period of years immediately before the menopause and the first year after the menopause" [3].

Oral health means much more than healthy teeth, and the relationship between oral and general health has been shown (WHO 2010). The majority of pain and discomfort in the oral cavity is due to diseases of the mouth. However, there are situations where oral symptoms are a consequence of systemic diseases or systemic alterations in physiological conditions. Oral discomfort is found in many menopausal women. The principal peri- and postmenopausal oral symptoms are dry mouth, sensation of painful mouth (PM) of several causes, and less frequently burning mouth syndrome (BMS) [4].

Sensation of dry mouth (xerostomia)

The sensation of DM or xerostomia is defined as a subjective sensation of dryness in the mouth [5]. Xerostomia is a major complaint for many elderly individuals and women seem to suffer from xerostomia or hyposalivation more often than men [6]. However, there is no convincing evidence that age alone is a significant cause of xerostomia [7]. The prevalence of xerostomia is difficult to determine. According to a review article by Orellana et al [8], the prevalence of self-reported sensations of DM (dry mouth) vary between 0.9% and 64.8%. Prevalence studies of xerostomia are difficult because of the heterogeneity of the patients. Also there are no standardized questions for diagnosing xerostomia. Xerostomia has various causes, and this symptom is often associated with an unpleasant feeling and other symptoms in the mouth and throat [9]. As there is no doubt that xerostomia impairs the quality of life and also causes oral complications, it is important in clinical practice to recognize and distinguish between patients with subjective complaints and those who have evidence of salivary hypofunction or who are suspected of having some disease, in order to manage these conditions appropriately [10].

Sensation of Painful Mouth (PM) and Burning Mouth Syndrome (BMS)

Many menopausal women suffer from oral discomfort. DM and PM are prevalent in women of menopausal age. Also, but less frequently, BMS is diagnosed. It is important to distinguish between the terms PM and BMS as they represent two different symptoms or syndromes. However, until recently there has not been consensus concerning the definition of PM and BMS. Therefore there can be confusion in interpreting different data.

Painful Mouth

PM has been associated with reduced salivary flow rate and the presence of removable dentures. Mandibular dysfunction [11] and also diffuse gingival atrophy or oral ulcerations can be present with oral dryness, causing PM. Other possible causative factors of PM are oral candidosis [12], pernicious anemia and some nutritional deficiencies (vitamin B-deficiencies) [11].

BMS- Burning Mouth Syndrome

BMS is defined as a chronic condition characterized by a burning sensation of the oral mucosa, with or without dysgeusia (the distortion of the sense of taste) and xerostomia, in the setting of no identifiable clinical lesions, laboratory abnormalities, or causative systemic disease [13].

BMS is a chronic condition in which there is a burning sensation in the oral cavity. The main clinical feature of BMS is burning pain. In addition, altered taste sensations and DM are reported by these patients. The pain is described using terms such as burning, stinging, tickling or sticking sensation. This pain can be localized just to the tongue and/or lips but the pain can also involve the whole of the oral cavity and in most patients it occurs bilaterally [14]. In most cases the burning pain has continued for many months and the intensity of pain tends to increase towards the end of the day. The diagnosis of BMS can be made when the oral mucosa is normal on clinical examination and there are no identifiable oral lesions or laboratory abnormalities [14]. According to a prevalence study in Sweden by Bergdahl & Bergdahl [15], BMS affects 3.7% of the general population, and is more common in women (5.5%) than in men (1.6%). In their study this difference between genders was particularly seen after menopause in women.

Interestingly, like BMS with its unsolved etiology and difficulties in management of the symptom, vulvodynia is a chronic idiopathic pain syndrome with unknown etiology in vulva [16]. Based on some recent case reports, BMS and vulvodynia may share a common cause. It is not known how common “glossovulvodynia” is e.g. those patients seldom report genital symptoms to the dentist. The symptoms described by the patients suffering of vulvodynia (burning, stinging, rawness or stabbing), mimic the specific symptoms described by BMS patients. Vulvodynia has been treated with using drugs effective against chronic neuropathic pain, or with cognitive-behavioral therapy, electromyographic biofeedback, and in some cases with vestibulectomy [17]. These selected treatments suggest that, as has been proposed, this symptom is of neuropathic origin. However, management of vulvodynia remains poor and, like BMS, more studies on its treatment are needed according to the treatment of vulvodynia [16], as well as of BMS. However, in contrast to BMS, all adult female age groups suffer equally from vulvodynia.

Menopausal Effects on Periodontal Tissues

Periodontitis and gingivitis, prevalent oral diseases, have been connected to several systemic health changes. Menopause has also been associated with destructive periodontal disease in older women. The homeostasis of the periodontium involves complex multifactorial relationships. Oestrogen and progesterone are responsible for physiological changes in women at specific phases of their life. Menopause is associated with significant adverse changes in the orofacial complex.

Menopause has also been associated with destructive periodontal disease in older women [18]. Peak ovarian function occurs before age 30 and then declines gradually. The menopause transition (climacteric, perimenopause), defined as the months and years surrounding the last menstrual period, is precipitated by fewer functioning follicles and ova, a consequent reduction in oestrogen level and an inability to respond to pituitary GnRH, FSH and LH. The initial sign of the transition, which may begin in the 40s, is a reduction in menstrual flow. This usually is followed by missed periods [19].

Systemic Consequences during Menopause

The physiological changes associated with menopause cause some women to experience uncomfortable symptoms. Postmenopausal women are at a higher risk of hypertension, pro-atherogenic lipid changes, diabetes, and severe cardiovascular disease, compared with their premenopausal counterparts [20]. Multiple studies have demonstrated an association between postmenopausal status and increased levels of total cholesterol, low-density lipoprotein cholesterol (LDL-C), lipoprotein (a), and decreased levels of high-density lipoprotein-cholesterol (HDL-C) [21]. Although premenopausal women are at a lower risk of heart disease than men, a twofold increase in risk of CVD follows menopause [20]. Hot flushes have been recognized as a common menopausal symptom [21]. This symptom is related to the central nervous system, or CNS. Oestrogen deficiency leads to dysregulation of the hypothalamic temperature control centre, resulting in vasomotor symptom [20]. Another symptom of menopause is night sweats. These vasomotor symptoms usually resolve spontaneously within two to four years of the last menses [22]. Also, the postmenopausal

period is associated with an increased risk of osteoporotic fractures, myocardial infarction, menstrual cycle disorders, vaginal dryness and possibly an early onset of Alzheimer's disease [23,24].

Osteoporosis

Osteoporosis is defined as a skeletal disorder characterized by low bone mass and micro architectural deterioration of bone tissue leading to enhanced bone fragility, with a consequent increase in fracture risk [25]. The primary risk factors related to the development of osteoporosis include female sex and increasing age, but other risk factors have been identified: early menopause (younger than 45 years), cigarette smoking, high alcohol consumption, lack of physical activity, thin body frame, race (Asian or white), low calcium intake, excessive caffeine intake, certain medications (such as glucocorticoids and cytotoxic drugs) and certain diseases [26].

Osteoporosis is a major cause of morbidity, mortality and medical expense. Oestrogen deficiency is responsible for bone loss in postmenopausal women. However, hormone replacement of an adequate dosage can slow or prevent bone loss. Studies suggest that low oestrogen production after menopause is associated with increased production of interleukin 1 (IL-1), IL-6, IL-8, IL-10, tumour necrosis factor alpha, granulocyte colony-stimulating factor, and granulocyte-macrophage colony-stimulating factor, which stimulates mature osteoclasts, modulates bone cell proliferation, and induces resorption of both skeletal and alveolar bone [27].

Cardiovascular Diseases

Cardiovascular diseases (CVD) are rarely diagnosed in premenopausal women compared with age-matched men. According to results from Pepine et al. [28] clinically significant CVD occurs in women approximately 10 years later than in men. However, menopause has been known to be associated with the incidence of CVD [29].

Use of Hormone Therapy

Women are treated with HT not only to avoid climacteric symptoms but also to protect them from CVD and osteoporosis [30].

However, there is no doubt that many women clearly benefit from the use of HT, which may also have implications in the oral cavity. HT at the lowest effective dose is now recommended as an established treatment for healthy, recently postmenopausal women suffering with disturbing moderate to severe hot flashes (International Menopause Society Consensus Statement 2009).

Oral Symptoms and Hormone Therapy

Approximately two-thirds of the menopausal women with oral discomfort but without oral clinical observed abnormalities, found that oral symptom were relieved with the use HT. The authors suggested that oral discomfort may be related to steroid hormone withdrawal only in some postmenopausal women and that HT may improve the clinical and cytologic features only in some patients [31]. The same group also reported earlier that HT improved subjective and objective symptoms in 12 out of 22 patients treated with estriol and in 7 out of 10 patients treated with CEE plus NETA, suggesting that estrogen deficiency can be considered as a possible cause of oral discomfort in some postmenopausal patients and that HT may indeed improve subjective symptoms of these patients [32].

CONCLUSIONS

DM is a major complaint for many elderly individuals and is strongly associated with the menopause, but the exact mechanisms that mediate the sensation in these women have not been firmly established. Stressful social environments are common in the lives of midlife women." oral health is integral to general health". Therefore, importance of preventive dentistry should be increased with aging in female subjects.

REFERENCES

- [1] Frutos R, Rodriguez S, Miralles-Jorda L, Machuca G. *Med Oral* 2002;7(1):26-30, 31-5.
- [2] Kase NG. *Gend Med* 2009;6:37-59.
- [3] World Health Organization. WHO Kobe Centre for health Development Ageing and Health Technical Report Volume 3. Global review on oral health in ageing societies 2002b; October:4-6
- [4] World Health Organization. WHO. Policy bases. 2010; http://www.who.int/oral_health/policy/en/.
- [5] Visvanathan V, Nix P. *Int J Clin Pract* 2010;64:404-407.
- [6] Nederfors T, Isaksson R, Mörnstadt H, Dahlöf C. *Comm Dent Oral Epidemiol* 1997;25:211-216.
- [7] Eveson J. Xerostomia. *Periodontol* 2000 2008;48:85-91.
- [8] Orellana MF, Lagravère MO, Boychuk DG, Major PW, Flores-Mir C. *J Public Health Dent* 2006;66:152-158.
- [9] Cho MA, Ko JY, Kim YK, Kho HS. *J Oral Rehab* 2010;37:185-193.
- [10] Napeñas JJ, Brennan MT, Fox PC. *Odontol* 2009;97:76-83.
- [11] Lamey PJ, Lamb AB. *Br Med J* 1988;296:1243-1246.
- [12] Wardrop RW, Hailes J, Burger H, Reade PC. *Oral Surg Oral Med Oral Pathol* 1989;67:535-540.
- [13] Torgerson RR. *Dermatol Ther* 2010;23:291-298.
- [14] Zakrzewska JM, Forsell H, Glennly AM. *Cochrane Database Syst Rev* 2005;25:CD002779.
- [15] Bergdahl M, Bergdahl J. *J Oral Pathol Med* 1999;28:350-354.
- [16] Paavonen J. *Vulvodinia. Women's Health* 2006;2:289-296.
- [17] Bergeron S, Binik YM, Khalifé S, Pagidas K, Glazer HI, Meana M, Amsel R. *Pain* 2001;91:297-306.
- [18] Krejci CB, Bissada NF. *J Am Dent Assoc* 2002;133:323-9.
- [19] Ko-En Huang. *Sem Reprod Med* 2010;28(5): 396-403.
- [20] Polotsky HN, Polotsky AJ. *Sem Reprod Med* 2010;28(5):426-34
- [21] Carr MC. *J Clin Endocrinol Metab* 2003; 88(6): 2404-11.
- [22] Johnson SR. *Med Clin North Am* 1998;82:297-320.
- [23] Kenemans P, Van Unnik GA, Mijatovic V, Van Der Mooren MJ. *Maturitas* 2001; 38:41-8.
- [24] Paganini-Hill A. *Br J Obstet Gynaecol* 1996;103:80-6.
- [25] Derviş E. *Oral Surg Oral Pathol Oral Radiol Endod* 2005;100:349-56.
- [26] Waugh EJ, Lam MA, Hawker GA, McGowan J, Papaioannou A, Cheung AM, Hodsman AB, Leslie WD, Siminoski K, Jamal SA. *Osteoporos Int* 2009;20:1-21.
- [27] Farquhar C, Marjoribanks J, Lethaby A, Suckling JA, Lamberts Q. *Cochrane Database Syst Rev* 2009;15;(2):CD004143.
- [28] Pepine CJ, Nichols WW, Pauly DF. *Circ Res* 2006;99:459-461.
- [29] Shaw LJ, Bugiardini R, Merz CN. *J Am Coll Cardiol* 2009;54:1561-1575.
- [30] Lyytinen H. A Nationwide study on breast cancer risk in postmenopausal women using hormone therapy in Finland. Academic dissertation. Helsinki University print. 2009.
- [31] Forabosco A, Criscuolo M, Coukos G, Uccelli E, Weinstein R, Spinato S, Botticelli A, Volpe A. *Oral Surg Oral Med Oral Pathol* 1992;73:570-574.
- [32] Volpe A, Lucenti V, Forabosco A, Boselli F, Latessa AM, Pozzo P, Petraglia F, Genazzani AR. *Maturitas* 1991;13:1-5.