

# Oral Health and Menopause: A Comprehensive Review on Current Knowledge and Associated Dental Management

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## Abstract

The menopause is physiological changes in women that give rise to adaptive changes at both systemic and oral level. As we all begin to reach an older age, dental health and hygiene becomes a major concern. The dentist is often the first person to appreciate numerous changes that are experienced throughout the body during menopause. The teeth and gums are extremely susceptible to any hormonal changes that take place just before menopause and readily decrease body's ability to fight off minor infections or maintain a healthy balance of useful and harmful bacteria within the oral environment. This review aimed to develop better understanding for major oro-dental complications observed in women during menopause, and schematic approach towards the different dental management protocols used during these periods. Various internet based popular search engines were used to explore related data from literature, which includes PubMed, PubMed Central, Cochrane, Google, Medknow, Ebsco, Science Direct, and IndMed. Upon compilation of relevant data, it was observed that periodontal health is most severely affected (up to 60%) followed by dry mouth (25%) and burning mouth (glossodynia; 15%) which, in turn, may increase the occurrence of oral mucosal and dental diseases, such as candidiasis. Though, the usage of hormone replacement therapy is effective but it does not necessarily prevent or help women with oral symptoms. Therefore, well controlled long-term randomized studies are needed to establish more authentic clinical guidelines for successful management of such conditions.

**Keywords:** Burning mouth syndrome, Dental health, Dry mouth, Menopause, Post-menopausal complaints

## Introduction

Natural menopause is defined as a spontaneous cessation of natural menstruation for 12 consecutive months at 45-55 years of age (mean 50-52).<sup>[1]</sup> In a woman's life at middle age, through the climacteric course, circulating sex hormone levels change and this as expected results in several clinical effects that has a potential effect on the individuals psychological status and quality of life. Additionally, there are several hormonal changes

takes place during menopause, as a result the gums become more susceptible to plaque and thus leading to a much higher risk for gingivitis and advanced periodontitis.<sup>[2,3]</sup> Menopause can also affect bones throughout the body, reducing the relative anchorage that the jaw has on one's teeth.<sup>[4]</sup> As the first line of treatment, the first footstep in prevention of any irreversible damage is to maintain flawless oral hygiene habits to remove plaque and tartar from the mouth minimum twice a day. Other unpleasant symptoms associated to menopause are managed with hormone therapy (HT). In the third millennium, HT is extensively used to alleviate menopause related oral symptoms for the well-being of the women treated.<sup>[5,6]</sup>

Oral discomfort is found in many menopausal women in addition to general climacteric complaints. The principal pre- and post-menopausal oral symptoms are dry mouth, sensation of painful mouth (PM) due to various causes and less frequently burning mouth syndrome (BMS).

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Painful oral symptoms have been frequently associated with reduced salivary flow rate that may be further aggravated in presence of removable partial dentures. Other potential complications of dry mouth are mandibular dysfunction, diffuse gingival atrophy or oral ulcerations, oral candidiasis, pernicious anemia, etc.<sup>[7,8]</sup>

BMS is one of the major complications seen in menopausal and post-menopausal women. It is 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. The affected individual usually complains of moderate to severe, bilateral burning or cutting sensation of the tongue, lips or other oral mucosal surfaces. Women appear to experience from xerostomia more often than men.<sup>[9-11]</sup> One of the latest research shows that patients with xerostomia exhibit varying degrees of distress and anxiety related to the quality of life depending on the etiology of xerostomia.<sup>[12]</sup> However, according to Ship, *et al.* there is no difference in flow rates between premenopausal and menopausal women.<sup>[13,14]</sup> A reduced salivary flow rate has been suggested to cause oral symptoms during menopause. The salivary composition is not seems to be affected and altered in variety of oral and maxillofacial pathologies. However there are sufficient data available in the literature to show changed saliva compositions in menopause state including the changes in salivary proteins and calcium concentration.<sup>[15]</sup> Considering these facts, it is very important for all patients moving towards the age of menopause or currently experiencing this change to understand how menopause could affect their oral health and what can be done to avoid related complications like periodontal disease and tooth decay. In this review, authors has attempted to seek major oro-dental complications, practical guidelines and management approaches for women and their physicians in menopause-related oral health problems.

## Materials and Methods

Various internet based popular search engines (Google, Google Scholar, Yahoo), scholarly search bibliographic databases (PubMed, PubMed Central, Medline Plus, Cochrane, Medknow, Ebsco, Science Direct, Hinari, WebMD, IndMed, Embase) and textbooks were searched until October 2012 using MeSH (Medical Subject Headings; PubMed) based keywords such as “menopause”, “post-menopausal complaints”, “oral discomfort”, “dental health”, “saliva”, “BMS”, “dry mouth”, “xerostomia”. The search was limited to reviews, meta-analyses and clinical guides in dental journals published over the last 30 years in English and Spanish. A total of 198 articles were identified. After examining the titles and abstracts, this number was finally reduced to 42 articles, and after compiling information from each of them we added two further articles (two case-control study), due to their relevance. Thus, a total of 44 publications were finally considered to assess clinical as well as follow-ups following management.

## Oral Alterations During Menopause

The promptly fluctuating hormonal levels in menopausal women are the key factors that are answerable to the alterations detected within the oral cavity. The most frequent oral manifestations during menopause are detailed below.

### Periodontal health and menopause

Endocrinal alteration induced bone resorption appears to be the principle pathogenic mechanism underlying accelerated bone loss in postmenopausal women with no direct relationship between the two phenomena.<sup>[16-20]</sup> Female gender-related hormonal situations, such as pregnancy- and puberty-associated gingivitis are known as temporary periodontal diseases.<sup>[21,22]</sup> In literature, there are very few studies that correlate only menopause or an estrogen-deficient state to susceptibility to periodontal disease.<sup>[23,24]</sup> Though, systemic bone loss may be a risk indicator for periodontal destruction, and augmented rates of bone mineral density loss after menopause are coupled with greater risk of tooth loss.<sup>[25,26]</sup> Therefore, avoidance and management of osteoporosis after menopause could also have enhanced future oral health consequences.<sup>[25,27]</sup> A number of studies have shown that changes in periodontal conditions might be associated with variations in sex hormone levels.<sup>[23]</sup> The occurrence of periodontitis was reported significantly greater in post-menopausal women not using HT than premenopausal women.<sup>[28]</sup> On the other hand, post-menopausal women using HT and premenopausal women had similar periodontal status.<sup>[29]</sup> A population-based epidemiological study of 4,290 participants in Germany concluded that post-menopausal women who were using estrogen had higher number of teeth than men of the same age group.<sup>[29]</sup> In addition, women without hormone treatment had less teeth than other women in this study. This finding is in accordance with results from the Women’s Health Study from the United States were among the 42,171 post-menopausal women the overall risk of tooth loss was 24% lower in current HT users than in non-users.<sup>[30]</sup> Nevertheless, further studies with longer follow-up time are needed to evaluate the effect of HT on oral health parameters. The role of HT in ameliorating oral symptoms is still controversial.<sup>[31,32]</sup>

### BMS

BMS, also known as glossodynia or stomatodynia, mainly affects women in the fourth or fifth decade of life. The disorder shows a clear female predominance (7/1 over males).<sup>[33]</sup> BMS is described as a burning sensation affecting different areas of the oral cavity (tongue, palate, lips, areas of denture support). It is often bilateral, and is characterized by the absence of pathological findings. The accompanying symptoms may include dry mouth sensation or alterations in taste sensation.<sup>[34-36]</sup> The underlying causes remain unclear. It has been suggested that female sex hormones and neuropathic factors may be implicated, possibly through small-fiber sensory neuropathy of the mucosa oral. Normal clinical tests and explorations distinguish primary BMS from secondary stomatodynia. Treatment consists of low-dose topical (without

swallowing) or systemic clonazepam. The association of this drug to tricyclic antidepressants has afforded variable results.

### Saliva and menopause

Hypo salivation associated subjective oral dryness or Xerostomia is another common manifestation in post-menopausal women. The patients typically report a decrease in salivary flow, despite the fact that in only one-third of all cases hyposialia actually present.<sup>[17]</sup> In a case-control study of 38 post-menopausal women, a negative correlation was found between the severity of dry mouth sensation and the salivary concentration of 17-beta-estradiol.<sup>[17]</sup> In these patients ample water intake must be recommended, along with sugar-free sweets or chewing gum to induce salivation. In some cases, sialogogues such as pilocarpine may be indicated. Several authors (up to 45%) have shown that women who start using HT report improvement in their quality of life including less oral discomfort. They have further proposed 'increased saliva secretion' as main reason behind such positive finding.<sup>[9,10,37-39]</sup> These results also indicate that the composition of saliva in post- and pre-menopausal women seems to be estrogen dependent. Additionally, HT seemed to have no effect on the amount of the total salivary bacteria in either peri-menopausal or post-menopausal women.<sup>[37]</sup> Ship, *et al.* in their study in the USA on 43 healthy pre-menopausal and post-menopausal females, showed that there were no alterations in the quantity of saliva, suggesting that among healthy women salivary gland function is not significantly influenced by menopause or HT.<sup>[13]</sup> A study comparing stimulated and un-stimulated salivary progesterone in menopausal women with oral dryness feeling showed that subjects with dry mouth had decreased un-stimulated saliva flow and salivary progesterone compared with those without dry mouth. Thus, salivary progesterone level appears associated with oral dryness feeling in menopause.<sup>[40]</sup>

Salivary cortisol levels in post-menopausal women with oral dryness were studied in details by Farzaneh, *et al.* where they found it to be in direct proportion with severity of oral dryness.<sup>[41]</sup>

These partly conflicting results need to be confirmed in larger studies as data on the effect of menopause on saliva is based on small patient numbers and no randomized controlled trials exist on the effect of HT on salivary secretion and composition. It is also worth noting that doses of hormones that have been used earlier vary in formulation in different studies, and that hormone doses to relieve climacteric symptoms were higher in the past than those presently recommended for similar situation.<sup>[39,42]</sup>

### Oral Health and Dental Management in Menopause; the Right Way to Approach

For all post-menopausal women, full clinical history should be compiled followed by thorough intraoral examination, together with complete evaluation of the mucosal membranes, the periodontal and dental conditions, and salivary flow for both quantity and quality. The significant confirmatory

tests (X-rays, periodontal probing, sialometry) must also be performed wherever needed. Moreover, it is crucial to maintain low levels of dental plaque by introducing adequate oral hygiene aids (interproximal brushes, dental floss, brushing frequency and technique), together with the use of chemotherapeutic agents such as chlorhexidine digluconate. These substances reduce the accumulation of dental plaque, improves periodontal disease and prevents caries (elimination of much of the presence of *Streptococcus mutans*), particularly root caries, which are more frequent in elderly individuals.<sup>[16,43]</sup> The use of toothpastes, varnishes or gels containing fluorides is also advised for the prevention of dental caries.

### Conclusion

In post-menopausal women, alterations of the oral cavity are related to the hormone alterations that characterize these patients and to physiological aging of the oral tissues, potentially giving rise to periodontitis, BMS and xerostomia. Today the standard of dental treatment allows people to retain their own teeth but it seems that many periodontal problems still occur. Interestingly, as shown in this review, the relative occurrence of PM seemed to be associated with climacteric symptoms in general, but the use of HT did not reduce the prevalence of oral symptoms. The role of HT in ameliorating oral symptoms is still controversial. It seems that the effect of HT is highly individual so that some women with menopause-related symptoms benefit from HT while others do not. However, so far there are no randomized controlled studies to answer these questions. Therefore, further studies with longer follow-up time are needed to evaluate and authenticate the effect of HT on oral health parameters.

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