



How menopause affects oral health: A comprehensive review on current knowledge

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ABSTRACT

Menopause is associated with a large number of symptoms ranging from physical to psychological. These symptoms may unfavorably affect oral health and treatment needs requiring dentists to be aware of the symptoms and health care needs of peri-menopausal/menopausal/postmenopausal women. After menopause, women become more susceptible to periodontal disease. 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. We believe the problem is due in large part to estrogen deficiency with resulting bone loss and inflammatory processes. Osteoporosis and periodontal disease are best diagnosed early so that treatment can be started sooner and fractures and tooth loss can be prevented.

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Introduction

The menopause is physiological changes in women that give rise to adaptive changes at both systemic and oral level.[1] Menopause refers to the permanent cessation of menstruation owing to loss of the ovarian follicular activity. Menopause may however be artificially induced by radiation, surgery, and chemotherapy.[2,3] As we all begin to reach an older age, dental health and hygiene becomes a major concern. Natural menopause is defined as a spontaneous cessation of natural menstruation for 12 consecutive months at 45-55 years of age (mean 50-52).[1] 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.[4,5] Menopause can also affect bones throughout the body, reducing the relative anchorage that the jaw has on one's teeth.[6]The prevalence of oral discomfort was found to be appreciably higher in peri/postmenopausal women than in premenopausal women (43% vs. 6%).[7]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)[8,9] BMS is one of the major complications seen in menopausal and post-menopausal women.[10,11,12] However, according to Ship, *et al.* there is no difference in flow rates between premenopausal and menopausal women.[13,14]Other potential complications of dry mouth are mandibular dysfunction, diffuse gingival atrophy or oral ulcerations, oral candidiasis, pernicious anemia.[15] Another recent study conducted by Imirzalioglu evaluated the liaison between residual ridge resorption and radiomorphometric indices along with demographic factors.[16] The authors concluded that residual ridge resorption was not affected by gender ($P > 0.05$),

but was more commonly seen in patients over the age of 50 compared with those below 49 years of age ($P < 0.001$).[16]This review aimed to develop better understanding for major orodental complications observed in women during menopause, and schematic approach towards the different dental management protocols used.

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, Hinari, Science Direct, WebMD, IndMed, Embase) were searched 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. A total of 200 articles were identified. After examining the titles and abstracts, 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.

Results

During a result of diseases that are associated with menopause are as follows *periodontal*:

A number of studies have shown that changes in periodontal conditions might be associated with variations in sex hormone levels.[17] The occurrence of periodontitis was reported significantly greater in post-menopausal women not using HT than premenopausal women.[18] On the other hand, post-menopausal women using HT(hormone therapy) and premenopausal women had similar periodontal status.[19] 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.[19] 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.[20] 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.[21,22].

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). [23] 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.[24,25,26] 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.[26]

Xerostomia: 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.[27] 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.[27] 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.[13,14,28,29,30] These results also indicate that the composition of saliva in post- and pre-menopausal women seems to be estrogen dependent.[28] 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.[13] 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.[31]

Conclusions

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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