

## Oral Manifestations of Menopause

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### ABSTRACT

Oral health is an integral part of general health. Menopausal period has an important role in the reproductive life of a woman and gives rise to many physical and mental problems. The oral manifestations may vary for each patient in the form of burning mouth syndrome, xerostomia, mucosal changes, neurological disorders, osteoporosis, periodontitis, and eating disorders. As is the case in many developing countries like India, it is difficult for women to obtain access to healthcare services, as a result of a dearth of trained health care professionals at the grass root level and the specialized sector. It is the dentist's responsibility to treat them with care and refer postmenopausal women to a gynecologist for medical intervention, if necessary. This review attempts to provide an insight into the oral manifestations of menopause. Various internet based popular search engines were used to explore data from literature, which includes PubMed, PubMed Central, Google Scholar, Medknow, and Science Direct. Search was made using the key-word combinations "menopause"; and "oral manifestations" were used. The search was limited to reviews, meta-analyses and assorted clinical reports were retrieved and evaluated. A total of 40 publications were evaluated for this article.

**KEY WORDS:** Menopause, oral manifestations, symptoms, xerostomia

### INTRODUCTION

India is the second most populated country after China. It has been estimated that by the year 2026, 173 million people will have age over 60 years and 103 million individuals will account for the menopausal population.<sup>[1,2]</sup> The World Health Organization defines menopause as "the permanent cessation of menstruation due to loss of ovarian follicular activity".<sup>[3]</sup> Menopause means "without estrogen" and it is the time at which cyclic ovarian function known as menstruation ceases. Menopause is diagnosed retrospectively following 12 months of amenorrhea with no pathology. Menopause can thus be said to be a universal reproductive phenomenon.<sup>[4]</sup> Menopause may also be artificially induced by radiation, surgery and chemotherapy.<sup>[5]</sup>

The terms menopause and climacteric are often used synonymously, but the two differ in that "menopause" refers

to the date of the last menstrual cycle and represents a shorter and defined period, while "climacterium" or "perimenopause" implies a much longer period with series of events, which eventually lead to loss of female reproductive capacity.<sup>[5,6]</sup>

Menopause begins in the fourth decade of life and is heralded by a decrease in the menstrual flow which is followed by missed menses.<sup>[7]</sup> Three consecutive months of amenorrhea or average menstrual cycle lengths > 42 days are suggestive of approaching menopause.<sup>[8]</sup> There are a number of physical changes associated with menopause, some of which are manifested in the oral cavity.<sup>[9]</sup> The teeth and gums are more affected by the hormonal changes occurring before menopause, which decrease the body's ability to fight minor infections or maintain a healthy balance of useful and harmful bacteria within the oral environment.<sup>[10]</sup> The dentist needs to be aware of oral symptoms of perimenopausal, menopausal and postmenopausal women to be able to diagnose and treat such patients with extra care.<sup>[11]</sup> Thus, this review attempts to provide an insight into the oral manifestations of menopause.

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## METHODS OF LITERATURE SEARCH

The materials for this review were obtained from an extensive search using Medical Subject Headings of electronic databases which included PubMed, PubMed Central, Google Scholar, Medknow, Science Direct and Textbooks were searched until 2013. Literature on the effect of menopause on the oral cavity was retrieved. The key words used for the literature search included “menopause” and “oral manifestations”. The search was limited to reviews, meta-analyses and assorted clinical reports were retrieved and evaluated from 1989 to 2013 in English. A total of 46 articles was identified. After examining the titles and abstracts, this number was finally reduced to 40 articles. A summary of oral manifestations of menopause by various authors’ is depicted in Table 1.

### Oral changes at menopause and their management

The patient could manifest any of the following:

#### Burning mouth syndrome

Burning mouth syndrome (BMS) is an idiopathic burning discomfort or pain affecting people with clinically normal oral mucosa, in whom a medical or dental cause has been excluded.<sup>[12]</sup> BMS was previously described as glossodynia, glossopyrosis, stomatodynia, stomatopyrosis, sore tongue and oral dysesthesia.<sup>[5,12]</sup> It mainly affects the tongue and sometimes the lips and gums. The symptoms are usually burning sensation which is usually bilateral and may be associated with alterations in taste (dysgeusia) and breath, dry mouth, swallowing difficulties and facial or dental pain.<sup>[5,6,8,10,13,14]</sup>

Burning mouth syndrome mainly affects women, particularly after menopause.<sup>[5,6,10,12,15,16]</sup> Burning mouth can be caused by infections, allergies, vitamin deficiencies, and ill-fitting dentures, leading to problems identifying effective treatments.<sup>[5,6,12]</sup> It may also be associated with Sjogren’s syndrome or post-radiation treatment in the head and neck region.<sup>[5,15]</sup> In some cases, it may be associated with psychogenic factors, such as anxiety, depression, or personality disorders.<sup>[5,6,12]</sup> People with BMS may show altered sensory and pain thresholds, or other signs of neuropathy.<sup>[12]</sup> Meurman *et al.* studied the relationship between oral discomfort and the menopause in 149 women and observed that the prevalence of oral discomfort was significantly higher in perimenopausal and postmenopausal women (43%) than in their premenopausal counterparts (6%).<sup>[16]</sup> It has been suggested that female sex hormones and neuropathic factors may be implicated, possibly through small-fiber sensory neuropathy of the oral mucosa.<sup>[11,17]</sup>

Variable results have been obtained following treatment of BMS in menopausal women with hormone replacement therapy (HRT), low-dose topical/systemic clonazepam, psychological counseling, and tricyclic antidepressants.<sup>[5,10,11,15-17]</sup> Acupuncture has also been reported to be useful in reducing the burning sensation.<sup>[18]</sup> In denture wearing patients, a careful evaluation of denture fit and the foundation tissues is indicated, since denture adjustment or replacement may help to eliminate chronic irritation.<sup>[5]</sup> In instances, where burning mouth is due to allergy to acrylic denture base, it may be replaced with a metal denture base.<sup>[19]</sup>

#### Xerostomia

Xerostomia also known as dry mouth is another frequent symptom in postmenopausal women.<sup>[5,20]</sup> The patients typically report a decrease in salivary flow, though in only one-third of all cases is hyposialia actually present.<sup>[17]</sup> Compared to premenopausal women, postmenopausal women have decreased unstimulated and stimulated submandibular and sublingual salivary gland flow, which is unrelated to any medication effect.<sup>[6,8]</sup> A decrease in gonadal hormones at menopause is associated with a decrease in salivary flow and salivary composition.<sup>[21]</sup> Ben Aryeh *et al.*<sup>[22]</sup> observed significantly altered salivary composition in the women pointing to sympathetic activation due to psychological stress with increase in salivary IgA and total proteins, while others have not been able to delineate any alterations in salivary volume/composition. Agha-Hosseini *et al.*<sup>[23]</sup> observed a negative correlation between severity of dry mouth sensation and salivary concentration of beta-estradiol. Xerostomia may lead to an increase in caries, periodontal disease, glossodynia, dysgeusia, unpleasant metallic taste, oral candidiasis, difficulty swallowing and difficulty wearing removable dental prostheses.<sup>[6,8,15,21]</sup> Treatment involves

**Table 1: Various authors’ article on oral manifestations of menopause with key messages**

Authors	Article title and article type	Key message
Frutos <i>et al.</i> <sup>[5]</sup>	Oral manifestations and dental treatment in menopause (review article)	Xerostomia, lichen planus, benign pemphigoid, Sjogren’s syndrome and burning mouth syndrome, periodontal disease. Use of salivary substitutes and control of bacterial plaque is recommended
Dutt <i>et al.</i> <sup>[10]</sup>	Oral health and menopause: A comprehensive review on current knowledge and associated dental management (review article)	Periodontal health, dry mouth and burning mouth, oral mucosal and dental diseases, such as candidiasis. Hormone replacement therapy is effective but it does not necessarily prevent or help women with oral symptoms
Mutneja <i>et al.</i> <sup>[11]</sup>	Menopause and the oral cavity (review article)	BMS, xerostomia, mucosal changes, neurological disorders, osteoporosis, periodontitis, eating disorders
Steinberg <sup>[14]</sup>	Women’s oral health issues (review article)	Oral discomfort, oral mucosal changes, salivation, osteoporosis, eating disorders
Chaveli López <i>et al.</i> <sup>[17]</sup>	Dental considerations in pregnancy and menopause (review article)	Periodontitis, maxillary osteonecrosis, burning mouth syndrome, xerostomia, lichen planus, benign mucosal pemphigoid and Sjögren’s syndrome

BMS – Burning mouth syndrome

abundant water intake, together with sugar-free sweets or chewing gum to increase salivation also, in some cases sialogogues such as pilocarpine, bromhexine or bethanechol may be indicated.<sup>[10,11,16,17]</sup> Adequate oral hygiene (use of interproximal brushes, dental floss, brushing frequency and technique) together with chemotherapeutic agents such as chlorhexidine aids in reduction of the accumulation of dental plaque.<sup>[5,10,11,17]</sup> Use of toothpastes, varnishes or gels containing fluoride is advised for the prevention of dental caries.<sup>[5,10,11,16,17]</sup>

#### Mucosal changes

The oral epithelial maturation process is affected during menopause due to decrease in estrogen levels, leading to thin and atrophic epithelium.<sup>[23]</sup> An increase in certain mucosal disorders such as oral lichen planus, pemphigus vulgaris, benign mucosal pemphigoid, or Sjögren's syndrome has also been documented.<sup>[5,8,17]</sup> Female patients can report with menopausal gingivostomatitis. The gingiva and remaining oral mucosa are dry and shiny, vary in color from abnormal paleness to redness, and bleed easily.<sup>[14,24]</sup> Fissuring occurs in the mucobuccal fold in some women and comparable changes may occur in the vaginal mucosa.<sup>[24]</sup> In patients with xerostomia and sensitive mucosal tissues, a tooth- and or implant-supported restoration should be favored above soft tissue-supported restorations.<sup>[20]</sup>

#### Neurological disorders

Trigeminal neuralgia is also known to occur frequently in postmenopausal women owing to compression of superior cerebellar artery on any one of the branches of trigeminal nerve.<sup>[8,11]</sup> It is characterized by unilateral "electric-shock" like pain in the middle and lower third of the face.<sup>[11]</sup> Long-term estrogen deficiency arising from menopause seems to be related to a higher risk of developing Alzheimer's disease.<sup>[8]</sup>

#### Osteoporosis and periodontitis

Osteoporosis is a metabolic bone disease characterized by low bone mineral density or bone mineral density (BMD) that leads to fragility and susceptibility to bone fracture.<sup>[8]</sup> Estrogen receptors on the bone-resorbing osteoclasts recognize the paucity of estrogen and respond by increasing their activity, while estrogen receptors on the bone-forming osteoblasts respond by decreasing their activity.<sup>[8]</sup> The susceptibility to progressive periodontitis and osteoporosis enhances following menopause.<sup>[11,25-27]</sup> The exact pathogenesis remains unclear although increased accumulation of bacterial plaque and estrogen/serum osteocalcin deficiency have been suggested as etiological factors.<sup>[11,16,26,28]</sup> A study by Bullon *et al.* in 39 postmenopausal women, found low serum osteocalcin levels to be significantly correlated to a greater reduction in pocket depth and attachment loss after periodontal treatment.<sup>[28]</sup>

Study by Kribbs<sup>[29]</sup> found that women with severe osteoporosis were three times more likely to be edentulous than healthy, age-matched controls. Postmenopausal women have increased susceptibility to osteoporosis, so dental radiographs may demonstrate hypocalcified bone.<sup>[21,30]</sup> Osteoporotic patients require new dentures much more often than non osteoporotic patients.<sup>[9]</sup> A study was conducted by Ortman *et al.*<sup>[31]</sup> to determine the association between the degree of residual ridge resorption, sex and the age of the patient. Although analysis of data demonstrated a significantly larger percentage of women with class III (severe) residual ridge resorption ( $P < 0.05$ ), the difference could not be related to the occurrence of menopause. Yüzügüllü *et al.*<sup>[32]</sup> evaluated the relation between alveolar bone loss and radiomorphometric indices and concluded that alveolar bone loss and bone heights were not affected by age or gender.

A study by Taguchi *et al.*<sup>[33]</sup> suggested that postmenopausal women with missing teeth may have a higher risk of hypertension and subsequent vascular diseases than do those without missing teeth. Palomo *et al.*<sup>[34]</sup> concluded that postmenopausal women were not aware of their periodontal health and the risks involved to their systemic health. They suggested creating a taskforce comprising of periodontists, generalists, communication experts, and women at large, to develop informational guidelines.

Cortical measurements detected on dental panoramic radiographs may be useful for identifying younger postmenopausal women with low BMD or osteoporosis. Dentists should refer postmenopausal women with eroded cortex or thin cortical width ( $<3.0$  mm) for bone densitometry.<sup>[35]</sup>

Estrogen treatment decreases the risk for tooth loss.<sup>[25,36,37]</sup> This benefit may be because of estrogen inhibition of cytokine production in inflamed gingiva and in bone cells in the jaws. Studies have shown the beneficial effects of HRT on gingival bleeding and on mandibular bone density.<sup>[25,37]</sup> Studies also suggest that bisphosphonates (BP) slow the resorption of alveolar bone of the maxilla and mandible.<sup>[25,27]</sup> There has been concern about bisphosphonate-associated osteonecrosis of the jaw (ONJ). However, bisphosphonate doses for treating osteoporosis are much lower.<sup>[26]</sup> Treatment with oral Alendronate and Risedronate therapy have been noted to improve periodontal status.<sup>[26,27]</sup>

Patients with osteoporosis have no contraindications to dental implant placement. Nevertheless, proper oral hygiene prior to intervention will be highly advised. Although the risk of ONJ in subjects treated with BP is very low, patients should be informed and must sign consent with the inclusion of this specific point.<sup>[38]</sup>

### Eating disorders

Changes in dietary habits may be induced during menopause.<sup>[6,39]</sup> Individuals with loss of sensitivity to sweet tastes may sweeten foods with potentially serious consequences, especially for those with diabetes mellitus, cardiac disease or obesity.<sup>[39]</sup> Psychological distress in menopausal women may lead to eating disorders. Oral changes may arise from self-induced vomiting and resultant regurgitation of gastric contents.<sup>[11,14]</sup> Smooth erosion of enamel or perimylolysis; enlargement of the parotid glands; trauma to the oral mucous membranes and pharynx resulting from usage of fingers, combs, and pens to induce vomiting; angular cheilitis; dehydration and erythema may be observed in menopausal women suffering from eating disorders.<sup>[14]</sup>

## CONCLUSION

Menopause is an important phase in a women's life, where oral health cannot be neglected. Dentists need to treat them with care taking into account the systemic changes, which the patient is undergoing. Women need to be educated regarding the changes in the oral cavity and the care to be taken. To make all this possible dentists need to work in close consultation with the gynecologist by referring postmenopausal women with oral symptom to a gynecologist for medical intervention if necessary.

### Recommendations

Dentists should be aware of the effects of menopause on dental health. The following points should be stressed.<sup>[20,26,27,40]</sup>

- Patients' dental complaints and their expectations about treatment should be clearly defined to avoid any unrealistic expectations
- Dentists should include a question in the health history form about menopausal status, which would identify menopausal or postmenopausal women
- Regular dental visit to confirm implementation of oral hygiene
- Brushing twice daily with a fluoridated toothpaste
- Replacing tooth brush every 3–4 months
- Using a dental floss or an interdental cleaner to clean interproximally between the teeth
- Maintaining a balanced diet
- Maintain an adequate Vitamin D status to prevent and treat osteoporosis-associated periodontal disease.

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