



EGYPTIAN ACADEMIC JOURNAL OF  
**BIOLOGICAL SCIENCES**  
**ZOOLOGY**

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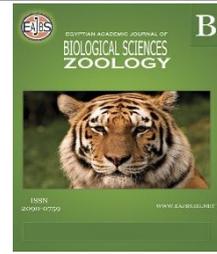


ISSN  
2090-0759

WWW.EAJBS.EG.NET

Vol. 14 No. 2 (2022)

[www.eajbs.eg.net](http://www.eajbs.eg.net)



## Hormonal Changes and Oral Health During Menopause: Review Article

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### REVIEW INFO

#### Review History

Received:17/9/2022

Accepted:22/11/2022

Available:27/11/2022

#### Keywords:

Menopause; oral  
changes; saliva;  
estrogen; periodontitis.

### ABSTRACT

To reduce the inevitable effects of menopause, awareness about oral health is critical to reducing problems that may be caused by hormonal changes. Low levels of estrogen ( $17\beta$  estradiol) affect the mucous membrane of the mouth is similar to the vaginal mucosa because they contain estrogen receptors. A reduction of  $17\beta$  estradiol also affects the maturation of the oral mucosa and can lead to atrophy and thinning leading to an increase in its sensitivity and producing it more susceptible to native mechanical injuries, which leads to a change in ache sensitivity. During menopause, the mucosal epithelium is more susceptible to infection, oral planus (OLP), candidiasis and burning mouth syndrome. Furthermore, hormones also affect the salivary glands, which causes alterations in saliva secretion and thickness, as a result, estrogen deficiency may cause problems in the tissues of the teeth and gums in postmenopausal women.

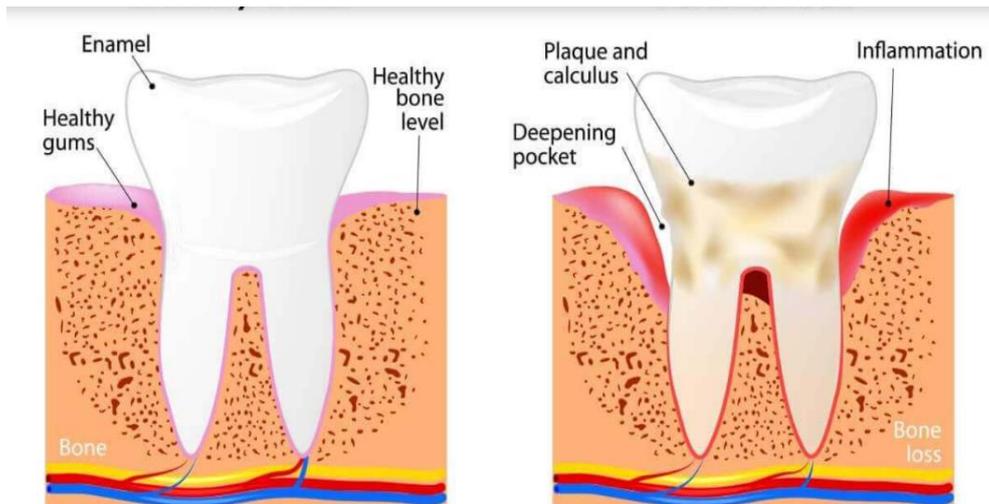
### INTRODUCTION

Menopause is a physiological phenomenon that affects women, resulting in adaptive alterations at both the systemic and oral stages. Menopause means "without estrogen." The World Health Organization knows this as the end of bleeding during menstruation, which normally takes place around the ages of 45 and 55 (Ciesielska *et al.*,2021). Menstruation is a crucial physiological manifestation in the life of a woman, the hypothalamus-pituitary-ovarian axis should be actively coordinated for natural menstruation to occur. The endometrium must be sensitive to ovarian hormones, and the inflow tube must be patent; any disruption in any of these elements causes problems (Lavaee *et al.*,2021). The ovarian secretion of estrogen and progesterone diminishes throughout the menopausal transition. This disorder is associated with physiologic alterations such as libido loss, vasomotor symptoms, vaginal dryness, sleeplessness, urogenital atrophy, osteoporosis and cardiovascular disease (Sunardi *et al.*,2017). The mouth cavity is a network of anatomical components that serve various roles. It is composed of both hard and soft tissues, and the range of its actions is extremely broad, the oral cavity's mucosa lining is extremely both sensitive to chemical and mechanical stimuli, consequently, the diseases situated in this region are oftentimes very uncomfortable and hard on sufferers (Petkowicz *et al.*,2013). According to certain research, 43% of postmenopausal women experience dental discomfort, Symptoms of dehydration, a

feeling of reduced salivation, a scorching feeling of the mucosal surface, dysgeusia, and alteration pain possibility (Im *et al.*,2019). Oral health awareness is critical throughout the menstruation time to avoid the inescapable problems caused by hormonal changes. Because 17  $\beta$  estradiol receptors are existent in both of these areas, a drop in estrogen hormone concentration has the same effect on the oral mucosa as it does on the vaginal mucosa (FaQJuma,2016). A lack of estrogen also alters the maturation of the oral mucous membrane. It can cause weakening, and leanness and fabricating it further tend to be more susceptible to nearby physical damage, as well as a reduction in pain possibility and difficulties employing detachable artificial repairs (Balan *et al.*,2012). Our check covers several of the most frequent oral alterations during menopausal women's cavities that cause pathogenic alterations, either indirectly or directly. As well highlights a similar crucial aspect of variations in women's psychological fields during this era, which can also turn into changes in the mouth and the severity of the perceived ailment. Furthermore, it offers a variety of basic prevention and treatment guidelines for females that can assist them to prevent or defeat their chronic disturbance in the mouth, which is common throughout this time of life.

### **Menopause and Periodontal Health:**

The primary pathogenic mechanism behind rapid bone loss in postmenopausal women seems to be endocrine variation and bone resorption, with no direct link between the two occurrences. Temporary periodontal illnesses are caused by hormone-related female conditions such as childbearing and adulthood-related inflammation of the gums (Fig 1) (Vieira *et al.*,2017). There has been very little research that links just the postmenopausal or a 17  $\beta$  estradiol deficiency in relation to gingiva inflammation risk. However, methodical osteoporosis is possibly a dangerous factor for gingiva inflammation, and increased bone mineral density rates concentration loss following menopause is associated together a higher risk of tooth loss (Romandini *et al.*,2020). As a result, avoiding and managing osteoporosis after menopause may have a positive impact on future oral health, several studies have found that alterations in periodontal diseases may be linked to changes in sex hormone concentrations (Li& Wang, 2018). Periodontitis was shown to be substantially more common after menopause, in women that did not use hormone replacement treatment (HRT) as compared to premenopausal women. Postmenopausal women utilizing HRT showed similar periodontal status to premenopausal women (Lipasti *et al.*,2021). Moreover, women without HRT had lesser teeth than other women. This data is consistent together findings according to Women's Health Research, which found that among 42,171 postmenopausal women, current HRT users had a 24% lower incidence of tooth loss than non - participants (Stuenkel *et al.*,2021). Nonetheless, more research extended follow-up dates are required and for assessing the influence of HRT on mouth health markers. The job of HRT in alleviating oral signs is still presently debatable (Kapoor *et al.*,2021).



**Fig. 1.** Stages of Periodontal Disease

### Menopause and Saliva:

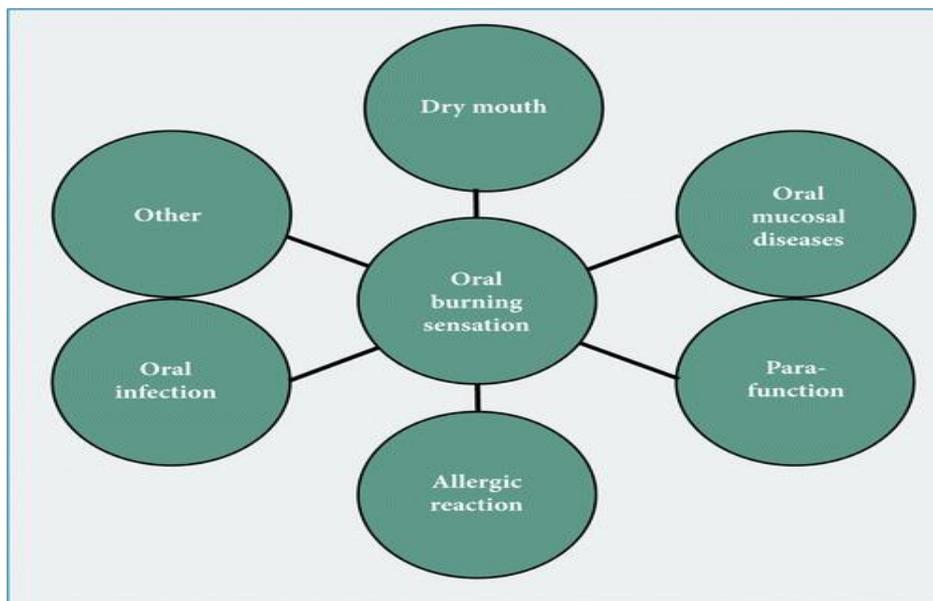
Xerostomia, also known as dry mouth, is one of the majority prevalent menopausal signs described in women. Xerostomia is a sensation of dehydration that is frequently produced by reduced saliva output by the submandibular or even when the salivary agent is adequate but contains fewer elements, this was approved by research in a collection of women aged 52–73 (Minicucci *et al.*, 2013). Xerostomia most commonly affects people over the age of 50, and it is most prevalent in pre and postmenopausal women, Dryness was reported in 17.8% of women pre-menopause and 23.3% of females through and 5 years next the end of menstrual cycles, next 5-9 years and through 10 years next the end of menstrual cycles, the effects were 34.5% and 29.2% (Santoro, 2016). Postmenopausal women had lower non-stimulated and activated sublingual and submandibular glands of salivary output, which was independent of any drug impact. Of course, the occurrence of correlated methodical disorders in women's menopause, such as rheumatoid arthritis, diabetes and complicates matters. Dry mouth is exacerbated by Sjögren's medical signs list and the ongoing administration of several drugs is one of the causes of dry mouth (Ben *et al.*, 2014). This is approved by (Cydejko *et al.*, 2020). Who sought to contrast the prevalent signs of the end of menstrual cycles and the status of the mouth septum, this study included 154 menopausal women, 58 of whom were mostly in good health and was not take other medicines, and the rest 94 were getting treatment for a variety of acute disorders. In 45% of normal end of menstrual cycles of women and 60% of those suffering from methodical illnesses, harassment and dry mouth occurred. A number of studies have sought to describe the link in the midst of menopause and dehydration orally by evaluating salivary activity in postmenopausal women. Dry mouth is common in the pre and postmenopausal periods, according to the research. The existence of those estrogen receptors in the salivary glands and the mouth's mucous membrane lining has been demonstrated in the literature. Steroid hormones also could be measured in saliva specimens, and those levels in saliva coincide with those in serum. Salivary flux rates are affected by an individual's estrogen level (Yakar *et al.*, 2021). Low saliva secretion, the primary defense element in the oral cavity, can cause a variety of issues, including increased dental cavities, dysphagia, oral infections, taste alteration, and greater susceptibility of the mucosa to mechanical assaults, to guarantee adequate and continual lubrication of the oral tissues, a typical stream of stimulated and unstimulated saliva is required (Mousa & Jassim 2021). The fluid specifications of saliva are essential for the volume of food, dissolving flavoring compounds, formation, and transferring them to

receptors for taste. It also allows for swallowing food chewing and talking. Since damp surroundings are also necessary for the colonization and proliferation of bacteria in mouth areas, inadequate saliva can disrupt microbial stabilization to the advantage of diseases like *Streptococcus* mutants and *Candida albicans* (Contaldo *et al.*,2020). Variations in the levels of steroid hormones have an effect on intestinal calcium absorption into the body, the menopausal period's decreasing estrogen levels lower intestinal calcium absorption (Wang *et al.*,2021). Hormone replacement therapy (HRT), which is now available in a wide variety of compositions, methods of administration and drops, appears must be the most efficient therapy for menopausal signs. However, deciding to adopt it could be difficult, particularly for females who have long-term medical issues like obesity, diabetes, or immune system of the body (Haas *et al.*,2009). Oral dryness symptoms were dramatically reduced during HRT, while mean salivary estradiol levels in menopausal women were raised. HRT can be useful in the treatment of these patients in terms of restoring salivary estradiol and, as a result, reducing symptoms of oral dryness (Ciesielska *et al.*,2021).

### **Menopausal Women's Mucosa:**

The mucosa of the mouth alterations after menopause can be likened to endometrial alterations that coincide with estrogen deprivation. According to some studies, the histology of the oral mucosa is comparable to that of the vaginal mucosa, and they both possess estrogen receptors (Prasanna *et al.*,2018). Hormonal alterations have a significant impact on the women's mouth cavity, either directly or, alternatively, indirectly through neural pathways, wasting of an organ alteration in the mucosa of oral can result in the creation of autoimmune diseases like oral lichen planus (OLP), pemphigus Vulgaris benign mucosal pemphigoid and as well else dysfunction such as increased candidiasis and idiopathic neuropathy due to elevated microorganism colonization (Leimola *et al.*,2000). The oral mucosa becomes more susceptible to infections throughout the menopausal phase. Premenopausal women have a higher occurrence of oral lichen planus (10.91%) than premenopausal women (0.5-2.0%). it's more common in women suffering from depression and other psychological disorders (Miranda *et al.*,2018). Dentures should be made as smooth as possible because of atrophic mucosa to minimize further traumatization of the mouth mucosa. Additionally, end of their menstrual cycles women is more vulnerable to having to eat and digestive issues. According to recent research, the menopausal period may represent a vulnerable period for women with eating problems. Psychological alterations, including commonly noticed depression, can result in self-induced vomiting, as well as alterations in the mouth cavity like dehydration, erythema and trauma to the mouth mucous membrane, angular cheilitis, and throat (Çayan *et al.*,2008). Furthermore, despite the absence of clinically evident infection, one of the most usual complaints of the mouth mucosa described by women in the same phase is a scorching sensation in the mouth. Burning oral disorder, additionally recognized as stomatodynia, stomatocytosis, glossopyrosis, glossodynia, or glossalgia, is among the generality common oral signs experienced by women in their 4th or 5th years of life (Fig.2) (Brigitta, 2022). The condition has a definite woman high prevalence (7/1 more than men) and a live connection. Searing mouth syndrome (BMS) is distinguished by the absence of clinical diseases in the mouth mucosa, anomalies in the laboratory, or causal systemic illness, but sufferers report a constant burning sensation in the mouth. Mouth pain was observed is be much more prevalent in premenopausal and after-menopausal women (43%), compared to premenopausal women (6%). (Scala *et al.*,2003). The tongue is the most commonly impacted location for pain, while other regions of the mouth such as the jaws, gums, lips, or sites of denture assistance could also be influenced. The suffering usually appears 3 to 12 years after menopause starts. Furthermore, the suffering may be

associated with mouth dehydration, sensitivities to certain nutrition molecules, changes in breath (dysgeusia), eating problems, taste and face or dental pain (Luo *et al.*,2021). Hormonal fluctuations, such as lower levels of progesterone and estrogen through the per menopause span, can have an impact on mental state. Certain microorganisms, like *Candida albicans*, *Streptococci*, *Staphylococci*, and varied anaerobes, have to be proposed as reasons factors of burning oral signs. Previous research found that HRT had a good effect on the number of teeth and on maintaining alveolar bone density and. Similarly, estrogen was helpful in reducing alveolar bone loss induced by estrogen deprivation when administered to mice. Meantime, there are conflicting studies on how much HRT alters periodontal tissue and the number of periodontal pockets. Salivary progesterone and 17-estradiol concentrations correlated positively with oral mucosal epithelial activation (Lee *et al.*,2019).



**Fig. 2.** Oral burning and burning mouth syndrome

### Conclusion

Changes in the oral cavity in postmenopausal women are linked to the hormonal changes that distinguish these patients as well as the physiological old age of the mouth tissues, possibly leading to xerostomia and periodontitis. Although modern dental therapy enables people to keep their very own teeth, it appears that more periodontal disorders currently exist. Surprisingly, as demonstrated in this analysis, the proportional prevalence of PM seems to be connected with different disorders in prevalent. Oral health is a vital element of overall health and has a direct impact on an individual's entire mental and physical health. As can be seen, early diagnosis of oral alterations in after-menopause women is critical and should be examined in conjunction with different systemic alterations. There is also a requirement for guidance on optimal oral health and lifestyle for menopausal women.

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