## **Review Article**

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# Menopause and the oral cavity: an oral hygiene update in Indonesia

### **Muhammad Fidel Ganis Siregar**

Department of Obstetrics and Gynaecology, Division of Reproductive Endocrinology and Fertility Medicine, Faculty of Medicine Universitas Sumatera Utara – 2014, Indonesia

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#### \*Correspondence:

Dr. Muhammad Fidel Ganis Siregar, E-mail: fgsiregar@gmail.com

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#### **ABSTRACT**

Menopause is cessation of menstrual period due to reduced estrogen and progesterone level. Menopause is diagnosed when a woman stops menstruating for at least 1 year. After menopause, women are more susceptible to periodontal diseases. Menopausal women complaining dry mouth should first of all determine salivary gland functions. Adequate salivary function should still maintain oral health. A complete history should be taken in cases of a burning mouth in post-menopausal women, several underlying causes may include psychological disorders, blood glucose, thyroid, and nutritional deficiency associated systemic disorders, and use of ACE inhibitors. In the absence of oral abnormalities, an alternate diagnosis may be Burning Mouth Syndrome. This review gives a general view on cases treated in Indonesia in which such conditions are treated based on the Indonesian Menopause Society (PERMI) guidelines for dental and oral disorders. The Indonesian national consensus concerning this matter necessitates the use of Hormonal therapy after taking a complete history, performing a physical examination, and obtaining patient informed consents. Although usually the domain of dentists, inter specialist cooperation should be encouraged.

**Keywords:** Menopause, Dry mouth, Burning mouth, Hormonal therapy

#### INTRODUCTION

Menopause is cessation of menstrual period due to decreased levels of estrogen and progesterone. Menopause is diagnosed if a woman stops menstruating for at least 1 year with no pathologic association. Menopause gives rise to adaptive changes at both systemic and oral level. The period of the menopause is characterized by important physiological changes in the woman body. 5

After menopause, women are more susceptible to periodontal disease.5 The main pathological oral conditions can be manifested as osteoporosis, periodontal disease (periodontitis, gingivitis, desquamative gingivitis), burning mouth syndrome, and xerostomia.<sup>6,7</sup> An observational analytic study in 127 menopause women in East Java found that no significant association between menopause and burning mouth syndrome.<sup>8</sup> This

problem is due to rapid reduction of estrogen levels in menopause.5,6 Many studies have shown that oral mucosa is sensitive to the effect of sex hormones, estrogen and progesteron.<sup>9-11</sup> However, Bercovici et al. (1985) stated that local irritating factors plays more important role instead of hormonal levels.<sup>12</sup>

The most destructive effect of declination of estrogen in reduction of bone density. Reduced bone density in the jaws may be linked to increased risk of tooth loss in individuals without periodontal disease or increased disease severity in individuals with periodontitis. The same process that causes bone loss in the spine and hip can also cause loss of alveolar bone in the jaw, so that periodontal disease, loose teeth, and tooth loss can occur simultaneously. The effects of 17- beta-estradiol deficit in menopause have been related to the inflammatory reabsorption of alveolar bone, though this association remains unclear. The inflammatory process of

osteoporosis is now beginning to be understood. Both periodontitis and osteoporosis show the same cytokines involved, implying that osteoporosis is also a disease controlled by osteoimmunological responses which may be associated with impact in cytokines from hormonal changes. <sup>18,19</sup> Osteoporosis and periodontal disease should be diagnosed early so that treatment could be started earlier in order to prevent bone loss and tooth loss. <sup>20</sup>

Although oral area is the responsibility of the dentist, the patient may need encouragement from doctors/gynecologists to practice good oral hygiene and visiting their dentist.<sup>21</sup>

#### ORAL SYMPTOMS IN MENOPAUSAL WOMEN

There are many symptoms related to teeth and mouth in menopausal women such as dry and burning mouth syndrome.<sup>22</sup>

#### Dry mouth syndrome

Dry mouth syndrome can be diagnosed by symptoms such as dryness and stickiness of the mouth, thirst, ulcer on the mouth or corner of the mouth, fragile mouth mucose, dryness of throat, dental caries, and bad breath (halitosis). <sup>23</sup> Dry mouth syndrome can be defined as: <sup>24</sup>

#### Xerostomia

A term that is used for subjective symptoms of dry mouth due to insufficient and altered salivary secretion.

#### Hyposalivation

An objective term that described decreased of saliva because of declined function of salivary glands.

#### Burning mouth syndrome

One can be diagnosed with burning mouth syndrome if he/she experienced intense and spontaneous burning sensation at tongue, lips, gums and oral mucosal membrane.<sup>25</sup> No underlying dental or medical cause can be identified and no laboratory abnormalities are present.<sup>26</sup> Wardropa et al. (1989) found no evidence of organic lesions in 33% women with burning mouth.<sup>27</sup> The underlying etiology remains ambiguous with hormonal changes and small-fiber sensory neuropathy of the oral mucosa suggested as probable underlying causes.<sup>28</sup>

#### **TREATMENT**

Patients should be advised to brush their teeth using fluoride toothpaste diligently, avoid sweet food, so that dental caries would be prevented.<sup>26,29</sup> Figure 1 shows the algorithm therapy of teeth and mouth.

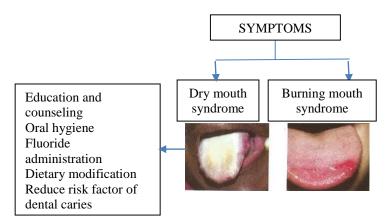


Figure 1: Algorithm therapy of teeth and mouth.<sup>26</sup>

#### Treatment of Dry Mouth Syndrome

A menopausal women with complaints of dry mouth needs to be examined for their salivary glands function. If the examination shows normal function, the treatment is limited to oral health education. But if there is a disturbance in salivary gland function, the initial management is to look for risk factors associated with dry mouth, such as side effects of antidepressant drugs, antihistamines and decongestants, drugs used to treat pain, anxiety, allergies, obesity, acne, diarrhea, nausea, psychosis, urinary incontinence, asthma, Parkinson's disease. Dry mouth can also be a side effect of muscle relaxants and sedatives. Or because of medical conditions including Sjogren's syndrome, diabetes, anemia, cystic fibrosis, rheumatoid arthritis, hypertension, stroke, mumps, HIV/AIDS, side effect of certain medical treatments like chemotherapy, damage to nerves, salivary gland surgery, damage to salivary glands, or because of smoking or chewing tobacco. If clinicians found risk factors as mentioned above, patient is educated to prevent it.26

Conservative treatment can be done by:

- Gargling drugs, sugar-free chewing gum.
- Acupuncture (resolve xerostomia by increasing salivary fluid flows).
- Electrostimulation: stimulate salivary fluid by stimulating lingual and buccal nerves. (Ideal procedure). 30,31

The algorithm for dry mouth syndrome can be found in Figure 2.

#### Treatment of burning mouth syndrome

A complete and deep history taking needs to be done to find the cause of Burning Mouth Syndrome complaints in postmenopausal women such as: any psychological disorders as anxiety and depression, systemic disorder due to an increase in blood sugar, thyroid disorders, nutritional deficiencies, use of ACE inhibitors. In addition, there are other possible causes such as: oral candidiasis, ulcers, oral mucosal laceration and

periodontitis. If any specific disorders mentioned above were found, the specific management will be needed.<sup>25</sup>

However, if the oral mucosal examination showed no abnormalities, the Burning Mouth Syndrome can be diagnosed.

- *Initial management*: topical medications such as topical anesthetic, analgesic sprays, gargles, topical estrogen or artificial saliva.
- If there is no improvement after initial treatment, start second-line therapy (systemic therapy). Drugs given are: tricyclic antidepressants, anticonvulsants as shown in Table 1 and Hormonal Therapy or Phytoestrogens.<sup>32,33</sup>

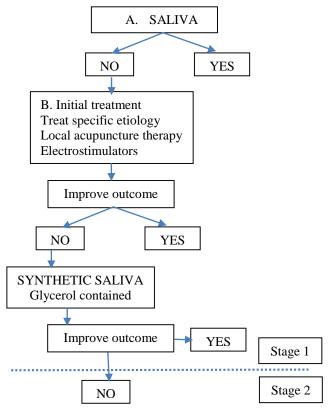


Figure 2: Algorithm of dry mouth syndrome treatment.<sup>26</sup>

Table 1: Second-line therapy (systemic therapy) for burning mouth syndrome.<sup>26</sup>

Type	Generic	Dosage	Usage
Tricyclic	Amitriptyline,	10-150 mg	10 mg
anti	Nortriptyline	per day	before sleep,
depressant			increase 10
			mg per 4-7
			days until
			symptoms
			diminished
			or side

			effects occur
Anti convulsant	Gabapentine	300-1600 mg per day	100 mg before sleep, increase 100 mg every 4- 7 days until symptoms diminished or side effects occur, daily dosage divided to three dosage

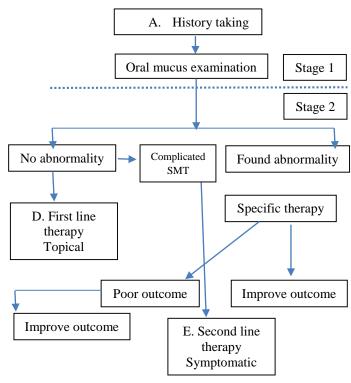


Figure 3: Algorithm burning mouth syndrome therapy. 26

# HORMONAL THERAPY (HT) AS A BASIC TREATMENT FOR MENOPAUSE WOMEN

Menopausal women should be given a clear and complete information before starting HT. Informed consent must contain the latest update and situation in HT benefit and side effect. Then the patient must be given informed consent and explanation. First, clinicians must collect history, physical examination and investigations such as: Pap smear, blood sugar level, blood lipid profiles, electrocardiography. If specific pathologic condition is found in a patient, clinicians must examine: liver

function, kidney function, Bone Mineral Density (BMD), and mammography. HT should be given appropriately after consultation with expert (Gynecologist). If the complaint is not reduced, it is necessary to consider the possible interference of drug absorption, or perhaps because the dose is not appropriate. If a complaint is reduced, do not forget to evaluate the possibility of side effects as a consequence of the pharmacological effects of the drug. 34-36 The appropriate algorithm for using hormone replacement therapy can be found in figure 4.26

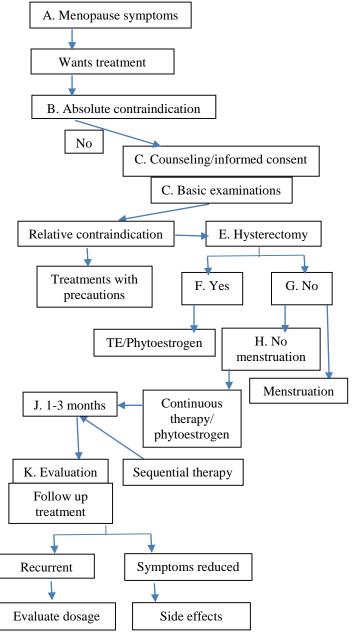


Figure 4: Algorithm using hormone replacement therapy.<sup>26</sup>

The following are some hormone replacement therapy types (Table 2), recommended dosage for estrogen (Table

3), and recommended dosage for progesterone (Table 4).<sup>26</sup>

Table 2: Hormone replacement therapy.<sup>26</sup>

No.	Regim en	Estrogen	Progesteron e	Notes
I	Only estroge n	Continuou s	Unnecessary	Without uterus (hysterect omy)
II		for women th	en and progester at still have uter	
a.	Sequen tial combin ation	Continuou s	Sequential (10-14 days per cycle)	Minimal vaginal bleeding
b.	Contin ue estroge n progest erone	Continuou s	Continue	No vaginal bleeding

Table 3: Recommended estrogen type and dose.<sup>26</sup>

Туре	Route (continue)	Dosage per day (mg)
Conjugated	Oral	0,3-0,625
17 β	Oral	1-2
estradiol	Transdermal	
estrogen	Subcutaneous	50-100
Estradiol	Oral	1-2
valerat		
Estradiol	Oral	0,625-1,25
(estrone		
sulphate		
piperazine)		

Table 4: Recommended progesterone type and dose.<sup>26</sup>

Туре	Sequential dosage per day (mg)	Continuous dosage per day (mg)
Progesterone	300	100
Medroxyprogestero ne acetate (MPA)	10	2,5-5
Cyproterone acetate	1	1
Dihydrogestrone	10-20	10

Table 5: Drug that contain estrogen, progesterone, and androgen.<sup>26</sup>

Type	Route	Dosage per day (mg)
Tibolon	Oral	2,5

Table 6: HRT/THP/TH drugs in Indonesia.<sup>26</sup>

Type	Contain	Patent
Only estrogen	17 β estradiol 1-2 mg Conjugated estrogen 0,3 mg	Estrofem
	Estropipat 0,625-1,25 mg	_
	Estradiol valerat 1- 2 mg	
	Estriol 1-2 mg	Ovestin
	17 β estradiol	Femseven
Only progesterone	Medroxyprogester one acetate (MPA) 5-10 mg	Provera
	Didrogesterone 10 mg	Duphaston
	Norethisterone 5	Primolut N
	mg	Norelut
	Linesterone 5 mg	Endometril
	Allylesternol 5 mg	Premaston
~		Pregnolin
Sequential estrogen plus progesterone combination	Estradiol 2 mg + cyproterone acetate 1 mg	Climen
	17 β estradiol 2 mg + norethisterone acetate 1 mg	Trisequens
	Estradiol valerat 2 mg (11 tabs) and estradiol valerat 2 mg and norgestrel 0,5 mg (10 tabs)	Cyclo Progynova
Continuous	Tibolon	Livial
estrogen plus progesterone plus androgen (specific)	17 β estradiol 1 mg (28 tabs)  Dropirenone 2 mg (28 tabs)	Angeliq
Only androgen	Andecanoate testosterone 40 mg	Andriol
	Mesterolone 25 mg	Proviron
	Fluoximesterone 5 mg	Halotestin
Injection		
Only androgen	Undecanoate testosterone 1000 mg	Nebido
Vaginal cream	D . 1 1	0
Only estrogen	Estriol	Ovestin

Some food that contain phytoestrogens can be found in Table 7. Food with the most phytoestrogens content is linseed with 379,380 mcg/100 g, followed by soy beans with 103,920 mcg/100 g. In Indonesia, many varieties of

soy bean-based food exists such as bean curd and *tempe* (fermented soy bean product).<sup>26</sup>

Table 7: Foods that contain phytoestrogens (mcg/100g).<sup>26</sup>

Linseed 379,380	
277,300	
Soy beans 103,920	
Tofu 27,150.1	
Soy yoghurt 10,275 Sesame seeds 8008.1	
Ramie bread 7540	
Oat bread 4798.7	
Soy milk 2957.2	
Garlic 603.6	
Mung bean sprouts 495.1	
Dried apricots 444.5	
Alfalfa sprouts 441.4	
Palm fruit 329.5	
Sunflower seeds 216	
Chestnuts 210.2	
Olive oil 180.7	
Almonds 131.1	
Green beans 105.8	
Peanuts 34.5	
Onions 32	
Blueberries 17.5	
Corn 9	
Coffee 6.3	
Cow's milk 1.2	
	out.
Vegetables Lignans Estr en	og
en	
soy         2         789.	6
Soy         2         789.           Garlic         583.2         603.	6 5
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.	6 5 7
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.	6 5 7 8
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.	6 5 7 8
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1	6 5 7 8
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80	6 5 7 8 3
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.	6 5 7 8 3
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5	6 5 7 8 3
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5           Strawberry         48.9         51.6	6 5 7 8 3
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5           Strawberry         48.9         51.6           Raspberry         37.7         47.6	6 5 7 8 3
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5           Strawberry         48.9         51.6           Raspberry         37.7         47.6           Watermelon         2.9         2.9	6 5 7 8 3
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5           Strawberry         48.9         51.6           Raspberry         37.7         47.6           Watermelon         2.9         2.9           Beans	6 5 7 8 8 3
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5           Strawberry         48.9         51.6           Raspberry         37.7         47.6           Watermelon         2.9         2.9           Beans         Green walnut         198.9         382.	6 5 7 8 8 3
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.5           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5           Strawberry         48.9         51.6           Raspberry         37.7         47.6           Watermelon         2.9         2.9           Beans         Green walnut         198.9         382.           Chestnuts         186.6         210.	6 5 7 8 8 3 3 5 5
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5           Strawberry         48.9         51.6           Raspberry         37.7         47.6           Watermelon         2.9         2.9           Beans         Green walnut         198.9         382.           Chestnuts         186.6         210.           Walnut         85.7         139.	6 5 7 8 8 3 3 5 5
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5           Strawberry         48.9         51.6           Raspberry         37.7         47.6           Watermelon         2.9         2.9           Beans         Green walnut         198.9         382.           Chestnuts         186.6         210.           Walnut         85.7         139.           Cashews         99.4         121.9	6 5 7 7 8 8 3 3 5 5 5 5 5 9
Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5           Strawberry         48.9         51.6           Raspberry         37.7         47.6           Watermelon         2.9         2.9           Beans         Green walnut         198.9         382.           Chestnuts         186.6         210.           Walnut         85.7         139.           Cashews         99.4         121.           Hazelnuts         77.1         107.	6 5 7 7 8 8 3 3 5 5 5 5 5 9
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Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5           Strawberry         48.9         51.6           Raspberry         37.7         47.6           Watermelon         2.9         2.9           Beans         Green walnut         198.9         382.           Chestnuts         186.6         210.           Walnut         85.7         139.           Cashews         99.4         121.           Hazelnuts         77.1         107.	6 5 7 8 8 3 3 5 5 5 5 9 5
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Soy         2         789.           Garlic         583.2         603.           Pumpkin         113.3         113.3           Beans         66.8         105.           Mustard         97.8         101.           Broccoli         93.9         94.1           Cabbage         79.1         80           Dried Fruits         177.5         183.           Peaches         61.8         64.5           Strawberry         48.9         51.6           Raspberry         37.7         47.6           Watermelon         2.9         2.9           Beans         Green walnut         198.9         382.           Chestnuts         186.6         210.           Walnut         85.7         139.           Cashews         99.4         121.           Hazelnuts         77.1         107.           Lentils         26.6         36.5           Drinks	6 5 7 8 8 3 3 5 5 5 2 5 9 5

Black tea	8.1	8.9
Coffee	4.8	5.5
Beer	1.1	2.7
Others		
Soy sauce	10.5	5330.3
Black liquorice	415.1	862.7
Oat bread	142.9	146.3

#### **CONCLUSION**

Several common disorders of the teeth and mouth can be found in menopausal women, such as Dry Mouth Syndrome and Burning Mouth Syndrome. Treatment is done following the algorithm management of dental and oral disorders according to the guidelines made by Indonesian Menopause Society (Perkumpulan Menopause Indonesia/PERMI). Hormonal therapy is a cornerstone treatment, done by an expert after gynecologic history taking, physical examination and laboratory diagnosis, agree consent of the patient, and careful evaluation during treatment. Dental and oral therapy should be provided by dentist. Therefore, good cooperation and communication between gynecologist and dentist will be necessary to achieve the best possible result.

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