

Assessment of periodontal health status in postmenopausal women visiting dental hospital from in and around Meerut city: Cross-sectional observational study

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ABSTRACT

Background: Puberty, menses, pregnancy, and menopause are the different phases of a woman's life which have a varied influence on oral health. During the menopause, women go through biological and endocrine changes, particularly in their sex steroid hormone production which affects their health. Because the oral mucosa contains estrogen receptors, variations in hormone levels can be seen directly in the oral cavity leading to a few oral conditions and diseases seen more frequently during postmenopausal years.

Objective: The objective of this study is to assess periodontal health status in postmenopausal women in and around Meerut city.

Materials and Methods: The study sample comprised ninety postmenopausal women. History of menopause was recorded, and the dental examinations were done by measuring the following parameters of periodontal health: plaque index (PI), gingival index (GI), bleeding on probing (BOP), pocket probing depth, and Russell's periodontal index. The collected data were subjected to statistical analyses.

Results and Conclusion: In the study group, mean age was 55 years, mean missing teeth were 10.3, mean duration of menopause was 9.23. Eleven percent females were completely edentulous, and 5 females had never brushed. Mean PI-s was 1.99, mean GI-s was 1.74, mean BOP was 52.85, and mean Russell's periodontal index was 4.34. Eleven patients were at the initial stages of destructive periodontal disease, 34 had established destructive periodontal disease while thirty patients had the terminal periodontal disease. These findings suggest that females after menopause are at a risk of developing destructive periodontal disease if proper oral hygiene practices are not followed.

Key Words: Periodontal status, postmenopausal women, Russel's periodontal index, sex steroid hormones

INTRODUCTION

Periodontitis, one of the most ubiquitous diseases, is characterized by the destruction of connective tissue

and dental bone support following an inflammatory host response secondary to infection by periodontal bacteria. Almost all forms of periodontal disease occur as a result of mixed microbial infections within which specific groups of pathogenic bacteria coexist.^[1,2] Various risk factors are associated with periodontal disease

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Access this article online

Quick Response Code:



Website:
www.jmidlifehealth.org

DOI:
10.4103/0976-7800.195696

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How to cite this article: Deepa D, Jain G. Assessment of periodontal health status in postmenopausal women visiting dental hospital from in and around Meerut city: Cross-sectional observational study. J Mid-life Health 2016;7:175-9.

which can be either modifiable and nonmodifiable. These include microorganisms, tobacco smoking, diabetes mellitus, cardiovascular disease, drug-induced disorders, stress, obesity, hematological disorders, host response, pregnancy, female hormonal alterations, and osteoporosis.^[3]

The homeostasis of the periodontium involves complex multifactorial relationships, in which the endocrine system plays an important role. Hormones are specific regulatory molecules modulating reproduction, growth and development, and the maintenance of internal environments as well as energy production, utilization, and storage.^[4] Being the regulators of reproductive functions, sex steroid hormones have potent effects on the nervous and cardiovascular system, on major determinants of the development and integrity of the skeleton, and oral cavity including periodontal tissues.^[5] In a woman's life at middle age, through the climacteric course, circulating sex hormone levels change and these results in several clinical effects that have a potential effect on the individual's psychological status and quality of life. Estrogen and progesterone are responsible for physiological changes in women at specific phases of their life: puberty, menstrual cycle, pregnancy, menopause, and postmenopause.^[6] Peak ovarian function occurs before age 30 and then declines gradually. The menopause transition (climacteric, perimenopause), defined as the months and years surrounding the last menstrual period, is precipitated by fewer functioning follicles and ova, a consequent reduction in estrogen level and an inability to respond to pituitary gonadotropin releasing hormone, follicle-stimulating hormone, and luteinizing hormone. The initial sign of the transition, which may begin in the 40 s, is a reduction in menstrual flow. This usually is followed by missed periods. Menopause is defined as the permanent cessation of menstruation due to the loss of ovarian follicular function, and usually takes place between 45 and 55 years of age, and has also been associated with destructive periodontal disease in older women.^[7]

Considering the high prevalence of oral health problems in postmenopausal women, the present study was conducted to assess the oral health status in postmenopausal women attending the periodontology outpatient department (OPD) Subharti Dental College and Hospital, Meerut, Uttar Pradesh.

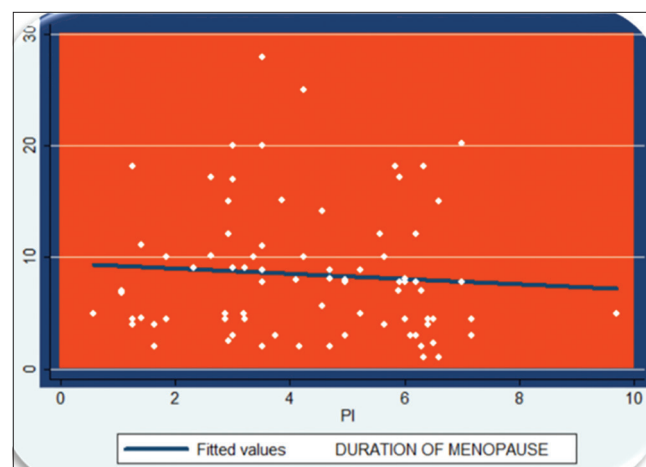
MATERIALS AND METHODS

A cross-sectional survey was conducted in ninety postmenopausal women, aged 45–80 years, attending the OPD. Informed consent of the patients was obtained

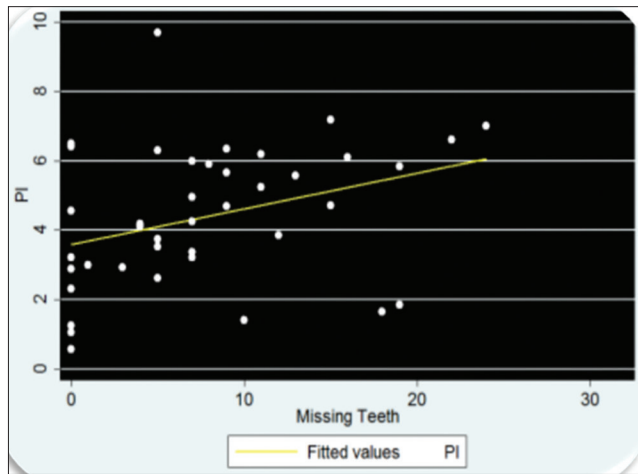
before the subjects were included in the study. The study was approved by the Ethical Committee for research of the Subharti Dental College and Hospital, Meerut. Before the dental examination, demographic information was recorded for each subject: age and duration of menopause were recorded. Clinical assessment of oral hygiene status was done with a mouth mirror and number 23 explorer and periodontal parameters such as plaque index (PI), gingival index (GI), gingival bleeding index, and pocket probing depth (PD) were also recorded. PDs were measured using a William's graduated probe at four sites per tooth. In addition, Russell's periodontal index was recorded, and the scores were given with the help of orthopantomograph for every patient. Patients who were requiring antibiotic prophylaxis; those having parathyroid and metabolic bone disease, cancer, or on long-term steroid therapy; having early onset of menopause; having history of hysterectomy; and alcoholics were excluded from the study. In addition, patients who had undergone any periodontal treatment in the last 1 year, and taking any other antibiotics in past 6 months were excluded from the study. The collected data were subjected to statistical analyses.

RESULTS

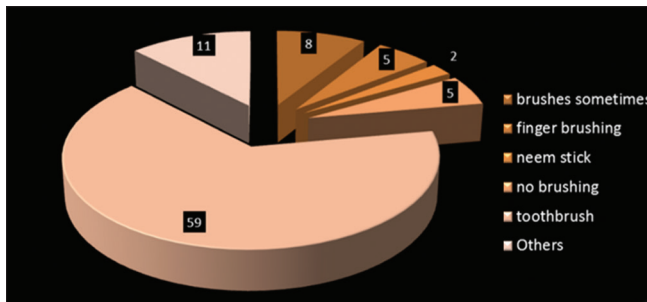
In the study group, mean age was 55 years, mean missing teeth was 10.3, and mean duration of menopause was 9.23 years [Graphs 1-8 and Table 1]. Five females had never brushed [Pie Chart 1]. Eleven percent females were completely edentulous [Pie Chart 2]. Mean PIs was 1.99; mean GIs was 1.74, mean bleeding on probing (BOP) was 52.85, mean Russell's periodontal index was 4.34. 11 patients were at the initial stages of destructive periodontal disease, 34 had established destructive periodontal disease while thirty patients had the terminal periodontal disease [Table 2].



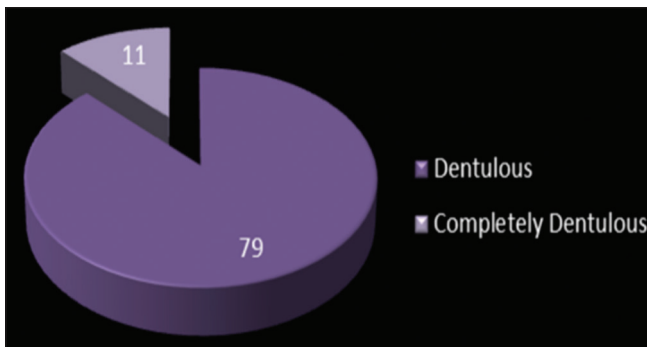
Graph1: Duration of menopause



Graph 2: Representation of missing teeth of subjects



Pie Chart 1: Oral hygiene methods followed by subjects



Pie Chart 2: Dentate status of subjects

DISCUSSION

Sex steroid hormones have been shown to directly and indirectly exert influence on cellular proliferation, differentiation, and growth in target tissues, including keratinocytes and fibroblasts in the gingiva. Estrogen is the main sex steroid hormone responsible for alterations in blood vessels of target tissues in females, stimulating endometrial blood flow during the estrogen plasma rise seen in the follicular phase. The menopause and the lack of ovarian steroids are known to promote important changes in connective tissue. The menopause triggers a wide range of changes in women’s body and the oral cavity. In menopause,

Table 1: Scores of Russel’s periodontal index

Clinical condition	Individual PI score	Frequency
Clinically Normal supportive tissues	0-0.2	0
Simple gingivitis	0.3-0.9	1
Beginning destructive periodontal disease	1-1.9	11
Established destructive periodontal disease	2.0-4.9	34
Terminal disease	5.0-8.0	30
NA	NA	14

Table 2: General characteristics of study subjects

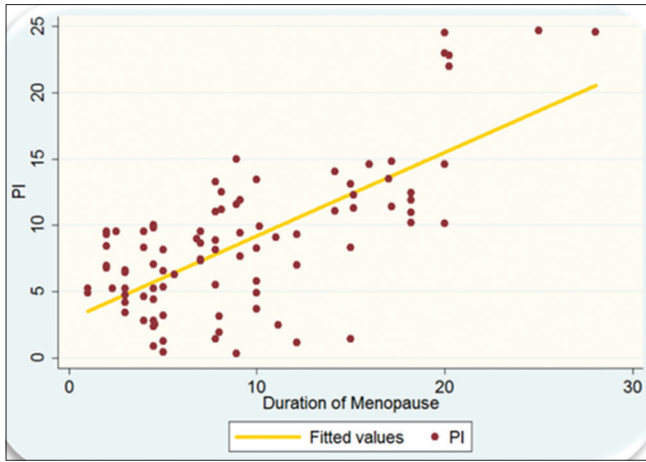
Variable	Obs	Mean	Std. Dev.	Min	Max
AGE	90	55.36667	8.295728	39	78
DURATIONOF~E	90	9.230444	6.102214	1	28
NOOFTEETHP~T	90	21.7	10.13776	0	32
MissingTeeth	90	10.3	10.13776	0	32
PIs	79	1.989494	0.6987863	1	4
GIs	79	1.73962	0.3752655	1	3
BOP	79	52.85924	24.03329	0	100
PI	79	4.336582	1.921245	0.56	9.7
FREQUENCYO~G	79	1.113924	0.4525524	0	2

the absence of ovarian sex steroids has been related to a worsening in gingival health.^[8] Katz and Epstein suggested that peripheral conversion of androgens to estrogens might be the main factor for protecting bone since estrogens have inhibitory effects on osteoclastic functions.^[9]

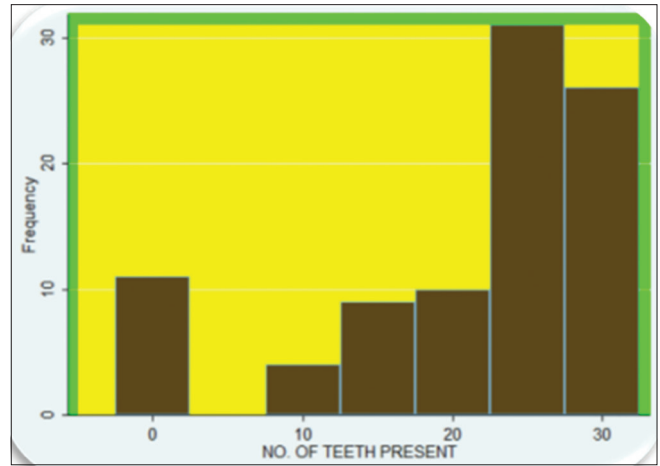
The effects of reduced estrogen levels on epithelial keratinization along with decreased salivary gland flow may have other significant effects on the periodontium. Mild signs and symptoms appear associated with the earliest menopausal changes.^[10] Women may demonstrate menopausal gingivostomatitis and the clinical signs of this disease are drying of the oral tissues, abnormal paleness of the gingival tissues, redness and BOP, and brushing. Oral discomfort is also commonly reported by postmenopausal women with burning sensation, xerostomia and bad taste.^[11]

Additional to the changes in the color, there is fissuring in the mucobuccal fold in some cases. The patient complaints of a dry, burning sensation throughout the oral cavity associated with extreme sensitivity to thermal changes, abnormal taste sensations described as “salty,” peppery or sour, and difficulty with removable partial prosthesis.^[10]

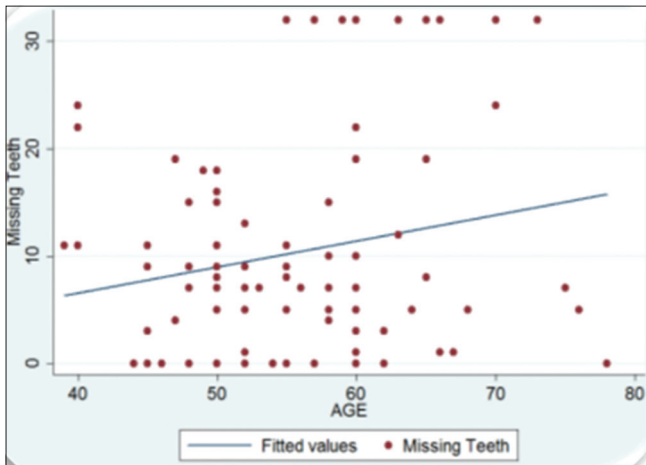
This increase in oral symptoms may result from endocrine disturbances (reduced estrogen), calcium and vitamin deficiency, and various psychologic factors during their menopausal years. They may complaint of dry mouth



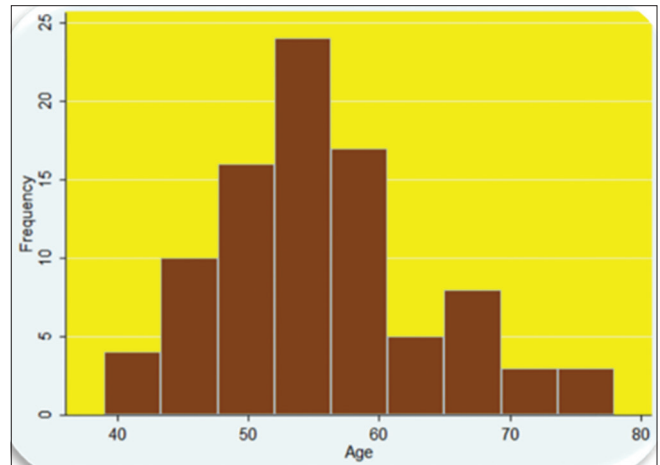
Graph 3: Relationship between periodontal index and duration of menopause



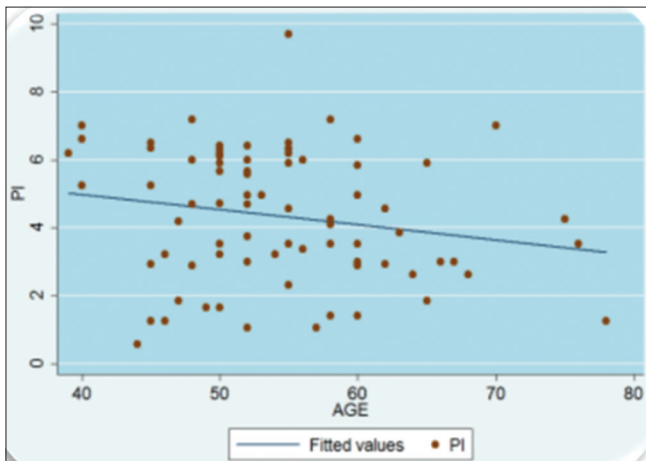
Graph4: Number of teeth present



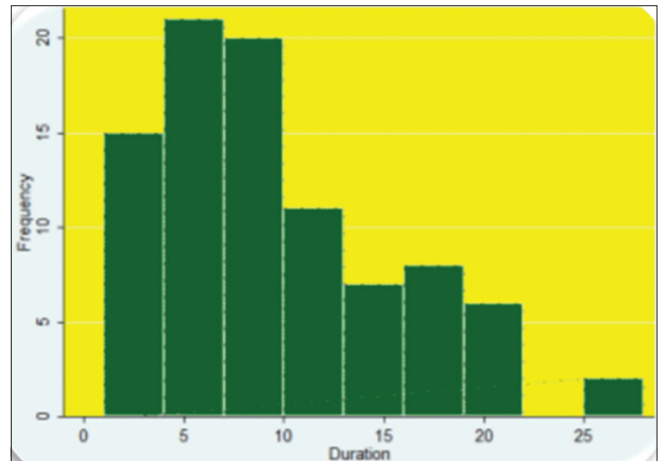
Graph 5: Representation of missing teeth with age



Graph 6: Representation of the age of study subjects



Graph 7: Representation of values of periodontal index with age



Graph 8: Duration of menopause of subjects

because of decreased salivary secretion, as well as a burning sensation of the mouth and tongue. Taste sensation may change causing frequent complaints of a metallic taste. Also

during menopause, women may experience dysesthesia, dental caries, periodontitis, and an osteoporotic jawbone unsuitable for conventional dental devices and implants.^[7]

Some women develop concurrent senile atrophic gingivitis, in which an abnormal paleness of the gingival tissues develops. Other people develop a condition known as menopausal gingivostomatitis, which is characterized by gingivae that are dry and shiny, bleed easily, and range in color from abnormally pale to erythematous.^[11]

The symptoms experienced by the postmenopausal women could be attributed to the reduction in epithelial keratinization, dryness of mucosa. Effect of osteoporosis in these women on periodontium includes: poor wound healing, less attachment formation, reduced bone mineral content in the jaws and increase of periodontitis, and tooth loss.^[12]

CONCLUSION

Female steroid hormones are neither necessary nor sufficient to produce gingival changes by themselves. They play significant role in altering periodontal tissue responses to microbial plaque, and thus directly may contribute to periodontal disease. They can influence the periodontium at menopause and postmenopausal period, thus requiring the need for periodical periodontal examination and treatment. The results of this cross-sectional study suggest that females after menopause are at a risk of developing destructive periodontal disease if proper oral hygiene practices are not followed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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