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# Evaluation of Periodontal Status among Premenopausal and Postmenopausal Women- A Comparative Study.

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## ABSTRACT

**Background**: The aim of the study was to compare the periodontal status among pre menopausal and post menopausal women. **Methods**: A total population of 100 women of age group 45-55 years visiting the Department of Periodontology,VMSDC, Salem, were taken and divided into two groups-pre and postmenopausal. All patients were evaluated for plaque index (PI), gingival index (GI), probing depth (PD),and clinical attachment loss(CAL). **Results**: The prevalence of periodontitis was significantly greater among postmenopausal women than among premenopausal women. Statistical analysis of data were carried out using mean ± standard deviation (SD), p – value, t – test between two groups; premenopausal and postmenopausal. For PI, GI, PPD and CAL, we found a highly significant difference p< 0.001 between two groups. **Conclusion**: Postmenopausal women had a greater chance of having periodontitis than premenopausal women.

***Keywords:*** Estrogen, Progesterone, Premenopausal, Postmenopausal, Periodontal status.

## INTRODUCTION

Periodontitis and gingivitis, a prevalent oral diseases, have been connected to several systemic health changes.[1] After menopause, women become more susceptible to periodontal disease.[2] The homeostasis of the periodontium involves complex multifactorial relationships. Oestrogen and progesterone are responsible for physiological changes in women at specific phases of their life. Menopause is associated with significant adverse changes in the orofacial complex.[1]

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As in progesterone level may change vascular permeability and then result in gingival swelling and inflammation and reduce resistance to dental plaque (i.e. bacteria). While change in estrogen hormone level can cause alteration in immune function and changes in flora ecology of the mouth.[3] Postmenopausal osteoporosis is closely associated with estrogen deficiency that results in increased bone resorption than bone formation.[4] 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 oestrogen level and an inability to respond to pituitary GnRH, FSH and LH. The initial sign of the transition, which may begin in the 40s, is a reduction in menstrual flow. Menopause is defined as the permanent cessation of menstruation due to loss of ovarian follicular function, and usually takes place between 45 and 55 years of age.[5] Studies suggest that low oestrogen production after menopause is associated with increased production of interleukin 1 (IL-1), IL-6, IL-8, IL-10, tumour necrosis factor alpha, granulocyte colony-stimulating factor, and granulocyte-macrophage colony-stimulating factor, which stimulates mature osteoclasts, modulates bone cell proliferation, and induces resorption of both skeletal and alveolar bone.[6,7] The purpose of current prospective study was to compare the periodontal status among premenopausal and postmenopausal women.

## MATERIALS AND METHODS

A sample of 100 women of age group 45-55years visiting the Department of Periodontology, Vinayaka Missions Sankarachariyar Dental College, Salem were randomly selected for this study and were categorized into two groups, namely group A(control group) and group B (study group). The group A consisted of 50

premenopausal women (before the onset of menopause) within the age group 45-55yrs and group B consisted 50 postmenopausal women (completed within 5yrs) within the age group 45-55yrs.

**Inclusion Criteria**: (for both groups)

1. Systemically healthy premenopausal women with age group between 45-55 years.
2. Systemically healthy postmenopausal women with age group between 45-55 years (within 5yrs)
3. Not undergone any type of periodontal therapy 6 months prior to the initial examination.

**Exclusion Criteria**: (for both groups)

1. Patients who need antibiotic prophylaxis
2. Early onset of menopause
3. Patients on long term steroid medication, hormone replacement therapy (HRT) and calcium

Informed consent was obtained from all patients. All the patients were evaluated for body mass index (BMI). The clinical measurements were made by the same examiner. A calibrated periodontal probe (UNC-15) was used to measure the following clinical parameters:

Plaque index (PI) (Silness and Loe,1964)

Gingival index (GI) (Loe and Silness, 1963)

Probing pocket depth (PPD) and clinical attachment level (CAL).

Both PPD and CAL were recorded at six sites (mesio-facial, mid-facial, disto-facial, disto-lingual, mid-lingual, mesio-lingual) per tooth.

## RESULTS

The data so collected was statistically analysed. Statistical analysis of data were carried out using mean ± standard deviation (SD), p – value, t – test between two groups; pre menopausal and postmenopausal. For PI, GI, PPD and CAL, we found a highly significant difference p< 0.001 between two groups as shown in Tables 1-4. The prevalence of periodontitis was significantly greater among postmenopausal women than among premenopausal women.

**Table 1: Plaque Index.**

| Plaque Index | N | $\overline{X} \pm SD$ | t | P |
|---|---|---|---|---|
| Pre Menopause | 50 | 1.31 ± 0.20 | 6.14 | < 0.001** |
| Post Menopause | 50 | 1.59 ± 0.26 | | |

Significant at 5 %; ** Significant at 1 %

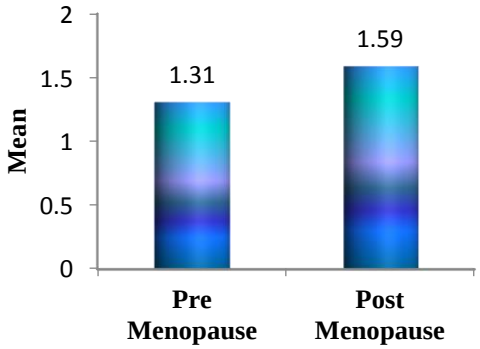


**Figure 1: Plaque Index.**

**Table 2: Gingival Index.**

| Gingival Index | N | $\overline{X} \pm SD$ | t | p |
|---|---|---|---|---|
| Pre Menopause | 50 | 1.23 ± 0.28 | 5.67 | < 0.001** |
| Post Menopause | 50 | 1.59 ± 0.34 | | |

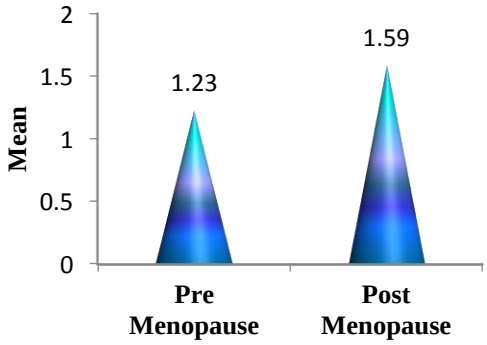


**Figure 2: Gingival Index**

**Table 3: Probing Depth.**

| Probing Depth | N | $\overline{X} \pm SD$ | t | p |
|---|---|---|---|---|
| Pre Menopause | 50 | 3.9 ± 0.74 | 11.52 | < 0.001** |
| Post Menopause | 50 | 5.46 ± 0.61 | | |

## DISCUSSION

The present study was to compare the periodontal status among premenopausal and postmenopausal women and the mean values of PI, GI, PPD, CAL were found to be significantly higher in

postmenopausal women. In the light of previous studies, estrogen deficiency is considered to be involved in the progression of periodontal disease during postmenopausal period (Payne et al, 1997; Reinhardt et al,1994).However, information about the effects of postmenopausal alterations on clinical signs of periodontal disease compared with premenopausal condition is limited.[8] Several researchers conclude that osteoporosis is directly related to the height of alveolar crest and to the teeth lost in postmenopausal women a (Wactawski-Wende et al 1996). Hidebolt et al (2002) concluded that there was a relationship between the alveolar crest height and the hormonal level. On the other hand, Klemetti et al (1994) observed that loss of teeth was unrelated to loss of bone density, and that the development of periodontal disease did not depend on bone density.[9] The rate of bone loss in healthy men is low, in the order of 3-5% per decade, whereas in women the process is more complicated. The rate of bone loss in the initial 10 post-menopausal years varies widely. It ranges from less than 1% to more than 5% per year for cancellous bone and from 0.5 to 2% for cortical bone.[10]

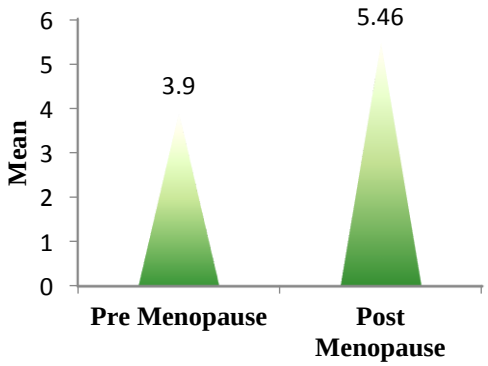


**Figure 3: Probing Depth.**

**Table 4: CAL.**

| CAL | N | $\overline{X} \pm SD$ | t | p |
|---|---|---|---|---|
| Pre Menopause | 50 | 3.06 ± 0.84 | 7.42 | < 0.001** |
| Post Menopause | 50 | 4.46 ± 1.03 | | |

Postmenopausal women with osteoporosis and low educational levels have a greater chance of having periodontal disease than do those without osteoporosis.[11] Estrogen also has been shown to inhibit T cell-mediated inflammation, suppress bone marrow production of leukocytes, and affect the distribution of polymorphonuclear (PMN) cells in peripheral blood of mice. E2 significantly reduced PMN chemotaxis in humans via a receptor-dependent mechanism. They recently found that in postmenopausal subjects with active periodontitis, gingival crevicular fluid levels of IL-1ß were significantly depressed in estrogen-sufficient women compared to estrogen-deficient patients.[12] Skeletal BMD is related to interproximal alveolar bone level and CAL, though not to a statistically signifi¬cant level; implicating postmenopausal osteopenia as a risk indicator for periodontal disease.[13] The prevalence of specific bacterial infections was determined for a large group of postmenopausal women. Those with infection were more likely to have oral bone loss.[14] The two-year SDD regimen was found to reduce periodontal disease progression (and reduced collagenolytic and bone resorption biomarkers in periodontal pockets) in post-menopausal women.[15]

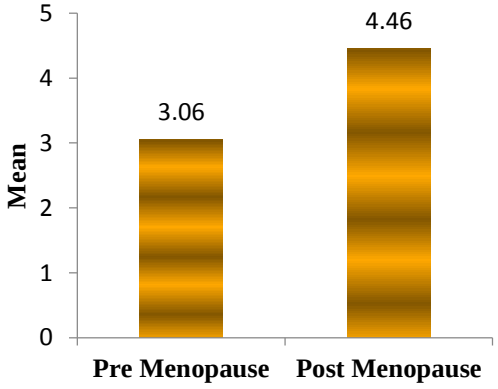


**Figure 4: CAL**

## CONCLUSION

Within the limitations of this study, we conclude that postmenopausal women have a greater chance for periodontal disease. This study will thereby help to create awareness among post menopausal women to go for a routine dental visit before progression to an active periodontal disease.

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