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PREVALENCE OF CHRONIC PERIODONTITIS AMONG POSTMENOPAUSAL WOMEN- HORMONE REPLACEMENT THERAPY A REMEDY?

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ABSTRACT: Menopause is a stage which every woman has to pass through. Menopausal stage brings physical changes as well as microbial changes in the oral cavity. The latter change is often left unnoticed, or it is neglected. The important feature during menopause is a rapid decline in the level of the hormone estrogen. Due to the gradual to a rapid drop in the level of the hormone, there is a lower absorption of the dietary calcium. This change will lead to a weaker bone or osteoporosis. Osteoporosis is seen in the alveolar bone, especially in the mandible area. Pockets are formed in the Periodontium (tissues and bone surrounding the tooth). These pockets will help the anaerobic bacteria like *Prevotella*, *Porphyromonas gingivalis*, *Fusobacterium*, and the other anaerobic bacteria to multiply and harbor leading to tissue damage and tooth loss. A comparative study was done between Premenopausal and Postmenopausal women. One hundred ten subjects were from each group was chosen for the study. Periodontal bacteria were isolated. Statistical analysis was done with the Chi-square test. P value was found significant for the main periodontal pathogens. These established Postmenopausal women were subjects of periodontitis when compared with Premenopausal women. HRT may help the Postmenopausal women in overcoming this difficulty and have better oral health.

INTRODUCTION: Menopause is a stage in women when there is a reduction in the production of the hormone Oestrogen. Often menopause is associated with osteoporosis. During this stage, there is a marked decline in the hormonal levels. This is due to the decrease in the function of the ovary. Those who attain menopause at an early stage are more prone to osteoporosis than those who reach menopause at a later stage ¹.

According to Baxter, about one by third of women population suffers from osteoporosis. This results in the reduction of the bone density which in-turn affects it's the strength and mass of the bone ². There is an imbalance in the Calcium phosphate equilibrium because there is less absorption of calcium by the body and an increase in the excretion of calcium due to the low level of estrogen. This is more evident in the mandibular region than the maxillary region ³.

Oestrogen deficiency in postmenopausal women and the related tooth loss is due to the loss of bone density in the jaw bone ⁴. Grodstein *et al.*, did a two year follow up study on postmenopausal women who were on estrogen replacement therapy and found that bone loss was lesser among hormone

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therapy users⁵. Grady *et al.*, provide evidence that estrogen is necessary to prevent bone loss in women. According to Paganini Hill, there was a 36% decrease in the tooth for estrogen takers⁶. Gotfredsen suggested that there was a 5% increase in the bone density in the head region in the case of those who are taking Hormone replacement therapy when compared to those who were taking a placebo⁷. Payne thinks that bone loss in postmenopausal may not be the sole reason for periodontitis, but it does have an influence on the severity of periodontitis⁸.

American Academy of Periodontology has considered one risk factor for periodontitis that is osteoporosis⁹. Not only osteoporosis, but osteopenia can also cause alveolar bone loss. In another study done by Norderyd *et al.*, had similar results of lower bone loss and periodontitis among HRT users when compared with nonusers, but was statistically non significant¹⁰.

Hormone Replacement Therapy: The bone density in women can be increased by hormone replacement therapy. According to Kimmel *et al.*, there is an increase in the bone density within 2 years of treatment¹¹. Controversies have been seen in the use of Hormone replacement Therapy due to the risk factors. The main controversy associated with HRT is endometrial cancer. And long term use of same has been associated with breast cancer. However modern combined formulations can reduce the risk to a great extent¹².

Periodontitis: Periodontitis is the acute infection of the gingiva that is caused by the multiplication of anaerobic bacteria. The infection leads to chronic periodontitis when these bacteria stop multiplying and start to harbor in the gingival tissues permanently¹³. A normal individual's mouth contains over 150 species of microorganisms.

Aerobic bacteria help in the formation of dental plaque, which gradually becomes gingivitis and finally leads into Periodontitis. During this stage, the presence of aerobic bacteria reduces and anaerobic bacteria dominate¹⁴.

In India, HRT is still very rare and is unknown to many women. The current study tries to find a comparison of Chronic periodontitis among premenopausal women and Post Menopausal

women. Common periodontal bacteria associated were isolated. This will emphasize the need for Physicians to take oral health care of post Menopausal women with more care.

METHOD:

Sample Collection: The subjects of the study were from Department of Periodontology, SRM Dental College, Chennai. Ethical Clearance was obtained from SRM University.

Study population:

- Female Patients with periodontal diseases in the age group of 15-65 will be included
- Control (Non- Periodontitis women)

Exclusion Criteria:

- ❖ Patients who have administered antibiotics within 6 months¹⁵.
- ❖ Subjects with less than 20 teeth.
- ❖ Patients with on-going systemic diseases which might influence either the oral microbial flora or host response or modify the progression of their periodontal disease¹⁶.
- ❖ Information will be obtained from the patients using a semi-structured questionnaire after obtaining their consent.
- ❖ The subgingival plaque will be collected from the deep periodontal pocket with the help of 2 paper points- aerobic and anaerobic culture, respectively.
- ❖ The conventional method will be employed for the culture of aerobic and anaerobic bacteria culture.

Microbiological Analysis: The subgingival plaque from the subjects was collected with the help of Sterile Toothpicks. The sample size was calculated and was arrived at 110 subjects in Premenopausal Stage and 110 from the Postmenopausal stage. The toothpick was gently inserted into the deepest depth of the pocket. Then the toothpicks were transferred into Brain Heart Infusion Broth for aerobic bacteria and Thioglycollate broth for anaerobic bacteria. Bacteria isolated were identified based on grams

staining and Biochemical tests. Oral hygiene index was calculated based on Green and Vermillion method. Gingival bleeding and Probing depth were noted for each patient.

RESULTS: Table 1 and Table 2 shows that most predominant aerobic bacteria that were isolated

from both Premenopausal and Postmenopausal women were *Streptococcus mutans* and *Lactobacillus*. Among anaerobic bacteria, *Peptostreptococcus* and *Veillonella* showed a higher percentage when compared with the other anaerobes.

TABLE 1: AEROBIC BACTERIA

Bacteria isolated	Pre menopause n =110	Post menopause n =110	Chi sq value	P value
Gram Positive Cocci				
<i>Staphylococcus sp.</i>	12	23	4.11	0.04*
<i>Staphylococcus aureus</i>	8	13	1.31	0.25
<i>Streptococcus mutans</i>	67	95	18.57	0.001**
<i>Streptococcus sp.</i>	53	46	0.9	0.34
<i>Enterococcus sp.</i>	31	66	22.58	0.001**
Gram-Positive Bacilli				
<i>Lactobacilli sp.</i>	47	79	19.02	0.001**
<i>Actinomyces</i>	15	17	0.14	0.71
Gram-Negative Cocci				
<i>Neisseria catrhallis</i>	35	77	32.08	0.001**
Gram Negative Bacilli				
<i>Escherichia coli</i>	16	19	0.31	0.58
<i>Haemophilus sp.</i>	12	10	0.21	0.65

TABLE 2: ANAEROBIC BACTERIA

Bacteria isolated	Pre menopause n =110	Post menopause n =110	Chi sq value	P value
Gram Positive Cocci				
<i>Stomatococcus sp.</i>	24	6	12.5	0.001**
<i>Gemella sp.</i>	1	0	1.005	0.31
<i>Peptostreptococcus sp.</i>	71	86	5.005	0.02
<i>Peptococcus sp.</i>	65	59	0.66	0.41
Gram Positive Bacilli				
<i>Bifidobacterium</i>	2	0	2.01	0.15
<i>Eubacterium</i>	14	24	3.18	0.07
<i>Propionibacterium</i>	10	12	0.20	0.65
<i>Aggregatibacter sp.</i>	2	1	0.33	0.56
<i>Actinomyces</i>	13	20	1.74	0.18
Gram Negative Cocci				
<i>Veillonella sp.</i>	67	79	2.93	0.08
Gram Negative Bacilli				
<i>Bacteroides</i>	45	59	3.57	0.06
<i>Prevotella sp.</i>	10	29	11.25	0.001**
<i>Porphyromonas sp.</i>	2	20	16.36	0.001**
<i>Fusobacterium</i>	30	47	5.77	0.01
<i>Leptotricha</i>	0	1	1.005	0.31

According to Moore, there is a progressive flora increase in the anaerobic bacterial flora during the progression of the disease, and as a result, the aerobes and the facultative anaerobes show a

decrease¹⁷. Table 3 shows the presence of chronic periodontitis is higher in postmenopausal women when compared to premenopausal women.

TABLE 3: COMPARISON OF CHRONIC PERIODONTITIS AND GINGIVITIS AMONG PREMENOPAUSAL AND POSTMENOPAUSAL WOMEN

Subjects	Total no: of samples collected	No: of samples with Chronic Periodontitis	Percentage of chronic Periodontitis	No: of samples with mild Periodontitis/gingivitis	Percentage of mild Periodontitis/gingivitis
Pre Menopausal	110	46	41.8%	64	58%
Post menopausal	110	88	80%	22	20%

Among aerobic bacteria isolated in the current study *Staphylococcus* sp. *Strep. mutans*, *enterococcus Lactobacillus*, *Neisseria catrhaalis* showed high significance. Statistical significance was shown for certain anaerobic bacteria like *Stomatococcus*, *Peptostreptococcus*, *Prevotella*, *Porphyromonas gingivalis* and *Fusobacterium*. High statistical significance for *Prevotella*, *Porphyromonas* and *Fuso bacterium* confirms chronic periodontitis rate is higher in the Postmenopausal group.

The main periodontal pathogens are *Prevotella*, *Porphyromonas gingivalis*, *Fusobacterium nucleatum*. According to Socransky *et al.*, these organisms form the orange complex, which shows a higher prevalence rate in the periodontal pockets. The orange complex is closely seen with the red complex. *Porphyromonas* forms a part of the red complex¹⁸. According to the findings from the study conducted by Hugoson *et al.*, *Prevotella intermedia* can substitute Hemin and Vitamin K with estrogen and progesterone¹⁹.

CONCLUSION: From the limitations of this study, it can be concluded that Postmenopausal women are subjected to severe oral health problems when compared to their premenopausal counterparts. According to Genco and Grossi estrogen deficiency is the main risk for periodontitis. Deficiency of estrogen leads to an increase in the production of bone-resorbing cytokines. When these come in contact with products from periodontal pathogens, it leads to resorbing of bones. The inflammatory response of the host to the biofilm triggers inflammatory responses, which in turn leads to tissue destruction, alveolar bone resorption and finally to tooth loss, which explains the increased prevalence of periodontitis in postmenopausal women²⁰.

Oral health awareness and Hormone Replacement therapy can bring down this problem to a great extent. Along with this general oral hygiene should be practiced. HRT can be useful to those women who attain menopause at an earlier age. Oral health is important as oral bacteria can lead to bacteremia, endocarditis, and other health problems.

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