Medical and Research Publications
International Open Access

Review Article **Journal of MAR Dental Sciences (Volume 6 Issue 5)**

Oral Hard and Soft Tissue Deterioration in Postmenopausal Women: A Review

Sahithi Koli *[1], Prathima Mallempalli [2], Kumar Chowdary Yaramati [3], Sai Charan Pasupuleti [4]

1,2,3. NTR University of Health Sciences, Vijayawada, India.

4. Health Informatics, Marshall University, WV USA.

Corresponding Author: Sahithi Koli, NTR University of Health Science, Vijayawada, India.

Received Date: December 26, 2022

Published Date: January 01, 2023

Abstract

Introduction: *Menopausal is a stage in a woman's life marked by a permanent end to menstruation and significant changes in sex hormone levels. Menopause is commonly accompanied by physiological and psychological changes, such as vasomotor symptoms, sleep problems, and mood swings. Women are more prone to oral disorders at various points in their lives when their hormone levels vary, such as during menstruation, pregnancy, and menopause.*

Purpose of the study*: The objective of this study was to evaluate the oral health status of a group of postmenopausal women.*

Methodology: *This study had been conducted by a literature review of scholarly articles, peer-reviewed articles, journals, and case studies. Ten database and seven government websites were used in this study. The study used fifteen articles for the collection of relevant information, which was then reviewed and reduced to twelve articles and were included in the research material.*

Results: *The results from this study illustrated that the women who have a history of periodontitis may also experience concurrent mental issues, or they may be more prone to developing periodontitis if they are depressed.*

Discussion: *In this investigation of postmenopausal women, researchers found that intake of total carbs, GL, starch, lactose, and sucrose were linked with decreased intra-individual diversity and a negative correlation with the alpha-diversity of our microbiome measurements. Additionally, researchers saw variations in the variety of the oral microbiome depending on the amount of total carbs, fiber, GL, sucrose, and galactose consumed (beta-diversity).*

Conclusion: *Periodontitis is linked to women's mental and physical health and improving oral health care is advised at many times of a woman's life, including menopause, to lower the chance of early tooth loss in women. Women who have a history of periodontitis may also experience concurrent mental issues, or they may be more prone to developing periodontitis if they are depressed. The findings imply that postmenopausal osteoporosis estrogen therapy recipients have a lower prevalence of severe periodontitis than non-treatment recipients.*

Keywords: *'Pregnancy gingivitis' AND 'Postmenopausal complications' AND 'Dental caries in postmenopausal phase' AND 'Osteoporosis in 40's' AND 'Soft tissue lesions in postmenopausal women'*

Introduction

In comparison to the non-treated group, the osteoporosis therapy group had a 44% lower prevalence of severe periodontitis. Chronic oral discomfort syndrome known as burning mouth syndrome (BMS) primarily affects peri- and postmenopausal women. The oral mucosa thins, the oral flora changes, and the alveolar bone mineral density declines because of postmenopausal changes. Oral mucosal burning is its defining feature, and dysgeusia, paresthesia, dysesthesia, and xerostomia may also be present.

Although the cause of the illness process is uncertain, it is assumed to have neuropathic roots. The most prevalent disease in the world is chronic periodontitis. Due to hormonal changes and in people with osteoporosis, postmenopausal women and people with periodontitis experience it more frequently. Gingivitis and periodontitis are two examples of periodontal diseases, which are widespread oral infections that can kill the tissues that support and encircle the teeth. Pathogenic microorganisms found in the subgingival biofilm can contribute to periodontal disorders.

The presence of these bacteria leads the gingival epithelium to produce chemokines and cytokines, which in turn enhances the permeability of gingival capillaries and triggers the chemotaxis of polymorphonuclear neutrophils into the gingival sulcus through the adhesive epithelium. Bleeding, gingival swelling, and soreness are the main symptoms of this illness, often known as gingivitis. The periodontal ligaments and alveolar bone may be destroyed if the condition is not treated before it spreads deeply into the tissue. It permits the development of periodontal pockets, often known as periodontitis. The prevalence of periodontitis ranges from 17 to 82%.

The prevalence of its severe form has been estimated to range from 4 to 11% in various areas. Systemic disorders have also been demonstrated to be linked to periodontal diseases. Studies have revealed a connection between periodontitis and conditions like rheumatoid arthritis, diabetes, cardiovascular disease, poor pregnancy outcomes, chronic kidney disease, and chronic obstructive pulmonary disease. Periodontal disorders are caused by several conditions, including stress, smoking, and diabetes. Hormonal changes in women are another element linked to this illness.

According to studies, hormonal changes in women that accompany adolescence, the menstrual cycle, pregnancy and its frequency, lactation, and menopause are linked to periodontitis. Estrogen and progesterone are these endogenous hormones. A prevalence of periodontitis ranges from 17 to 82%. The prevalence of its severe form has been estimated to range from 4 to 11% in various areas.

Systemic disorders have also been demonstrated to be linked to periodontal diseases. Studies have revealed a connection between periodontitis and conditions like rheumatoid arthritis, diabetes,

cardiovascular disease, poor pregnancy outcomes, chronic kidney disease, and chronic obstructive pulmonary disease.

Therefore, it can be said that sex hormones regulate periodontal tissue health and that changes in them can affect a person's periodontal state. Therefore, more research is needed to determine how these hormone changes affect periodontal health. Numerous research has looked at hormone-dependent alterations in women and demonstrated the impact of hormonal changes so far.

Methodology

The primary working hypothesis derived out this research was the finding oral diseases particularly in postmenopausal women.

The methodology used to derive this hypothesis was a literature used of scholarly articles, peer-reviewed articles, journals, and case studies. The research study began with the identification of soft and hard tissue diseases in postmenopausal women. This systematic review was conducted in a phase manner and included the establishment of an overall strategy, determination of the inclusion and exclusion criteria, and literature and case study classification and analysis.

Results

Women who have a history of periodontitis may also experience concurrent mental issues, or they may be more prone to developing periodontitis if they are depressed. In comparison to the non-treated group, the osteoporosis therapy group had a 44% lower prevalence of severe periodontitis. According to women of reproductive age, women in the postmenopausal period experience greater levels of alveolar bone loss in the mandible and maxilla. All of study participant were postmenopausal, with a mean age of 67.1. (7.0). Most of them (97.3%) were Caucasian and had at least some college education. In addition to the 43.5% past smokers and 4.5% current smokers, 52.0% of the women said they had never smoked. Diabetes (2.6%), heart disease (16.8%), and cancer (16.7%) were the reported baseline diagnoses of additional medical disorders.

The study cohort had mean PD, CAL, and percentage of sites with gingival bleeding of 2.2 mm, 2.4 mm, and 34%, respectively. On average, they were 66 years old, had 23 teeth, and had 23 teeth present. The average BMI was 26.6 kg/m2, which indicates clinical obesity. Women were mostly white (97%) and reported using hormone therapy 48% of the time, smoking 3% of the time, and having been previously diagnosed with and treated for diabetes 5% of the time.

Women were more likely than males to wash their teeth at least twice daily (77%) and visit the dentist at least once a year (92%). According to CDC/AAP criteria, the prevalence of none/mild, moderate, and severe periodontal disease was 25.1%, 58.3%, and 16.6%, respectively. The most frequently reported main problems seen in dental clinics are oral unease with dry mouth, altered perception, and burning feeling. Most oral sensory issues are brought on by underlying illnesses or drug interactions. This is not the case for a sizable portion of individuals seeking dental healthcare, though.

Many of these patients, according to earlier investigations, are menopausal women. A change in the quantity and/or quality of saliva has been linked to the likely cause of oral discomfort in menopausal women. Oral mucosal diseases are frequently developed in menopausal women. In these people, burning mouth syndrome is thought to be a typical oral condition. Postmenopausal women are also frequently found to have xerostomia.

Discussion

In this investigation of postmenopausal women, researchers found that intake of total carbs, GL, starch, lactose, and sucrose were linked with decreased intra-individual diversity and a negative correlation with the alpha-diversity of our microbiome measurements. Additionally, researchers saw variations in the variety of the oral microbiome depending on the amount of total carbs, fiber, GL, sucrose, and galactose consumed (beta-diversity). The relative abundance of Streptococcus mutans, a bacterium with an increase of carbohydrate metabolizing genes, was favorably correlated with intake of total carbs, GL, and sucrose. It is hypothesized that hormonal changes and decreasing bone mineral density increase postmenopausal women's propensity for alveolar bone loss. Menopause was formerly thought to increase the risk of periodontitis.

Results that were questionable, nonetheless, were reported. There is currently no agreement that there is a higher incidence of periodontitis following menopause. People who are experiencing emotional stress are more prone to have periodontitis. There is a two-fold larger frequency of mental diseases in women than in men, according to research. Women are more susceptible to depression during the menopausal transition. Examining quality of life and psychological stress factors as confounders in assessments of postmenopausal women's dental health is necessary. Low bone mineral density (BMD) is a symptom of osteoporosis, a systemic skeletal condition that has been linked to periodontal disease. The objective of this systematic review and meta-analysis was to confirm the empirical support for the link between postmenopausal women's low BMD and periodontal attachment loss. Up until August

2016, databases were used to conduct a thorough literature search in compliance with Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) standards.

Studies comparing clinical attachment loss (CAL) in postmenopausal women with low and normal BMD were among the requirements for eligibility. To compare CAL among women with normal BMD, osteoporosis, and osteopenia, studies employing comparable techniques, with lower and higher risk of bias, were merged into three different meta-analyses. By participating in the nitrate cycle, oral bacteria help to dilate blood vessels, which may reduce the risk of hypertension by increasing the availability of nitric oxide (NO). Oral microorganisms turn dietary nitrate into nitrite, which is then changed into NO, a strong vasodilator.

This is a significant source of NO production independent of oxygen. Nitrate-containing diets have been shown in randomized controlled trials to lower SBP,35 a finding that may be explained by the existence of oral bacteria. Alternately, problems with dentures could increase the risk of hypertension. Denture-related inflammation and irritation are frequent in the edentulous population, which may be a factor in the development of a chronic low-grade inflammatory condition. Additionally, dentures may have microbial flora that is identical to that in periodontal disease.

Increased inflammations may be a factor in the growth. To avoid the morbidity and mortality linked to hypertension, better oral hygiene aimed at preventing edentulism as well as vigilant blood pressure monitoring and intervention among the edentulous may be recommended. At least 700 different bacterial species have been found in the oral cavity microbiome, making it one of the most complex and diverse human microbiomes.

Many of these microorganisms play crucial functions in preserving dental health and regular function. Oral disorders like caries, gingivitis, and periodontal disease can develop because of changes in the ecology of the oral microbiota. There have been several studies comparing the subgingival microbiomes of people with various degrees of periodontal disease, and they show a clear distinction between the microbiota of healthy sites and those affected by periodontal disorders. These investigations have used culture, targeted checkerboard, and nontargeted 16S rRNA gene sequencing to pinpoint subgingival species. As a result, it can be inferred that sex hormones regulate the state of periodontal tissue and that changes in them can alter a person's periodontal status.

To better understand how these hormonal fluctuations affect periodontal health, more research is needed. Up to this point, numerous studies have looked at hormone-dependent changes in women and demonstrated the impact of hormonal changes during puberty, menstruation, pregnancy, and

menopause on periodontal tissue, but each of these studies has only looked at each event separately over a brief period.

Saliva is crucial for the defense mechanisms of the oral tissues and for preventing foreign substances from entering the body. The risk of developing numerous oral disorders increases when the salivary flow rate is decreased. It is crucial to assess the salivary flow rate for this reason. People with decreased salivary flow have been reported to have a higher incidence of dental caries, oral mucositis, dysphagia, oral infections, and changed taste. The high values of the OHI-S, DMFT, CPI, and LOA indices in our study are also associated with a considerable reduction in salivary flow rate.

Conclusion

Periodontitis is linked to women's mental and physical health and improving oral health care is advised at many times of a woman's life, including menopause, to lower the chance of early tooth loss in women. Women who have a history of periodontitis may also experience concurrent mental issues, or they may be more prone to developing periodontitis if they are depressed. The findings imply that postmenopausal osteoporosis estrogen therapy recipients have a lower prevalence of severe periodontitis than non-treatment recipients. These results show that postmenopausal edentulous women may be at a higher risk of having hypertension in the future.

Therefore, preventive strategies such as stricter blood pressure monitoring, dietary modification, physical exercise, and weight loss among the edentulous as well as improved dental hygiene among those at risk for tooth loss may be required to lower the disease burden of hypertension. Additional research is required to fully understand these findings and the potential impact of periodontal disease on the risk of hypertension. In this large, nationally representative sample, menopausal age, length of reproductive life, number of pregnancies/abortions, first birth age, and duration of nursing were all associated with severe periodontitis, while oral contraceptive and hormone replacement therapy use weren't really.

Younger women who were having their first child had much higher risks of having trouble chewing and developing dental caries. Age at first delivery, periodontitis, and dental caries all have correlations that are moderated by BMI. A benign nodular lesion known as a pyrogenic granuloma most frequently affects female gingiva during times of increased sex hormone production, such as puberty and pregnancy. In postmenopausal women, there is a noticeable decline in salivary pH and flow rate, which in turn causes an increase in OHI-S, DMFT, CPI, and LOA. According to the study, women's need for preventative dentistry grows as they age.

To address the typical menopausal transition and healthy postmenopausal life, the studies should give a thorough assessment of women's perspectives, health-care practices, and expectations regarding the responsibilities of social institutions. To ensure that menopausal and postmenopausal women have healthy post reproductive lives, such studies will aid in the development of public health services that are culturally suitable for them.

Reference

1. Genco, R. J., LaMonte, M. J., McSkimming, D. I., Buck, M. J., Li, L., Hovey, K. M., Andrews, C. A., Sun, Y., Tsompana, M., Zheng, W., Banack, H. R., Murugaiyan, V., & Wactawski-Wende, J. (2019). The Subgingival Microbiome Relationship to Periodontal Disease in Older Women. *Journal of dental research*, *98*(9), 975–984. https://doi.org/10.1177/0022034519860449.
2. Gordon, J. H., LaMonte, M. J., Zhao, J., Genco, R. J., Cimato, T. R., Hovey, K. M., Allison, M. A., Mouton, C. P., & Wactawski-Wende, J. (2019). Association of Periodontal Disease and Edentulism with Hypertension Risk in Postmenopausal Women. *American journal of hypertension*, *32*(2), 193–201. https://doi.org/10.1093/ajh/hpy164.
3. Johnson, T. M., Demsar, W. J., Herold, R. W., Bisch, F. C., Gerlach, R. C., & Swiec, G. D. (2011). Pyogenic granuloma occurring in a postmenopausal woman on hormone replacement therapy. *U.S. Army Medical Department journal*, 86–90.
4. Lee, S., & Park, S. (2020). Age at first childbirth in relation to oral health later in life. *Menopause (New York, N.Y.)*, *27*(10), 1104–1109. https://doi.org/10.1097/GME.0000000000001584.
5. Millen, A. E., Dahhan, R., Freudenheim, J. L., Hovey, K. M., Li, L., McSkimming, D. I., Andrews, C. A., Buck, M. J., LaMonte, M. J., Kirkwood, K. L., Sun, Y., Murugaiyan, V., Tsompana, M., & Wactawski-Wende, J. (2022). Dietary carbohydrate intake is associated with the subgingival plaque oral microbiome abundance and diversity in a cohort of postmenopausal women. *Scientific reports*, *12*(1), 2643. https://doi.org/10.1038/s41598-022-06421-2.
6. Mazur, I., Dilbarkhanov, B., Kuracha, X., Novoshytskyy, V., Suprunovych, I., & Zhakipbekov, K. (2020). Periodontal status and bone metabolism in women in reproductive and postmenopausal periods. *Hormone molecular biology and clinical investigation*, *41*(3), 10.1515/hmbci-2020-0011. https://doi.org/10.1515/hmbci-2020-0011.

7. Mehrad Rafiei, Somayeh Salarisedigh, Parvin Khalili, Zahra Jamali, Farimah Sardari, Hormonal Fluctuations and Periodontal Status in Postmenopausal Women, International Journal of Dentistry, 10.1155/2022/9990451, **2022**, (1-8), (2022).
8. Passos-Soares, J. S., Vianna, M. I. P., Gomes-Filho, I. S., Cruz, S. S., Barreto, M. L., Adan, L. F., Rösing, C. K., Trindade, S. C., Cerqueira, E. M. M., & Scannapieco, F. A. (2017). Association between osteoporosis treatment and severe periodontitis in postmenopausalwomen. *Menopause (New York, N.Y.)*, *24*(7), 789–795. https://doi.org/10.1097/GME.0000000000000830.
9. Penoni DC, Fidalgo TKS, Torres SR, et al. Bone Density and Clinical Periodontal Attachment in Postmenopausal Women: A Systematic Review and Meta-Analysis. *Journal of Dental Research*. 2017;96(3):261-269. doi:10.1177/0022034516682017.
10. Rukmini, J. N., Sachan, R., Sibi, N., Meghana, A., & Malar, C. I. (2018). Effect of Menopause on Saliva and Dental Health. *Journal of International Society of Preventive & Community Dentistry*, *8*(6), 529–533. https://doi.org/10.4103/jispcd.JISPCD_68_18.
11. Yalcin, F., Gurgan, S., & Gul, G. (2006). Oral health in postmenopausal Turkish women. *Oral health & preventive dentistry*, *4*(4), 227–233.
12. Yakar, N., Türedi, A., Emingil, G., Şahin, Ç., Köse, T., Silbereisen, A., & Bostanci, N. (2021). Oral health and emotional well-being in premenopausal and postmenopausal women: a cross-sectional cohort study. *BMC women's health*, *21*(1), 338. https://doi.org/10.1186/s12905-021-01480-5.