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REVIEW ARTICLE

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Comparative Assessment of Periodontal Health in Premenopausal and Postmenopausal Women

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ABSTRACT

Periodontitis refers to the inflammation of the tooth supporting tissues. It further results in complications like irreversible loss of bone and periodontal attachment loss. Menopause generally occurs at the fifth decade of life. Systemic changes are also manifested at menopause which may further result in oral changes in the individuals. During post menopause the gingival epithelium becomes thinner and gets more prone to osteoporosis, decreased saliva and inflammation. Therefore, the aim of the present study was to evaluate the periodontal health among premenopausal and post menopausal women. This study was carried out in a hospital setting (single centred study). Total number of sample size included 233 patients, who had visited Saveetha dental college, Chennai from June 2019 to April 2020. The inclusion criteria of the study was premenopausal women (aged 25 to 45 years) and post menopausal women (aged 55 to 75 years). Data collected includes age, menopausal status and different types of periodontal diseases. The collected data was tabulated using excel spreadsheet and the data was analysed using SPSS software version 19. The statistical test used in this study was the Chi square test. Generalised chronic periodontitis was most commonly present among postmenopausal women of age group 55 to 65 years. Generalised chronic gingivitis was more commonly seen in the premenopausal women of age group 25 to 45 years, which was statistically significant. According to the overall study results, the post menopausal women were commonly manifested with generalised chronic periodontitis compared to the premenopausal women. The primary cause of periodontitis is presence of local factors and impaired immune response. The imbalance in oestrogen hormones during menopause is one of the major factors that contributes to periodontal damage.

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INTRODUCTION

The menopause period in women is associated with important systemic and oral manifestations [1]. During menopause, the gingival epithelium becomes thinner, atrophied and more prone to inflammation. Interleukin has been associated with systemic diseases that follow a chronic inflammatory cascade [2]. On the other hand the salivary flow rate decreases contributing to development of several oral conditions[2,3]. The sudden decrease in the oestrogen production that occurs in menopause is the main cause of reduction in the bone mineral density which could further contribute to periodontal disease progression[2–4]. Estrogen reduction levels can also interfere with the periodontal ligament and further results in host immune inflammatory reactions[2–5][2–6] [7]. The prevalence and severity of gingivitis increases at the peak age of 21 to 30 years, and those of periodontitis increases significantly in individuals above the age of 40 years. Various studies have shown that periodontitis is common in men when compared to women, this is not seen in the older population[8]. Periodontitis represents a chronic inflammatory process ([9] .It refers to the destruction of the periodontal tissues namely the periodontal ligament, cementum, alveolar bone and the gingiva [9,10]. Gingivitis is the mild form whereas periodontitis results in loss of supporting structures of the tooth [9–11]. The severity of periodontitis continues to increase with age. Puberty, menstruation, pregnancy and menopause are the various stages that occur in the life of women. These stages affect their physical condition, especially their oral cavity. This is associated with hormonal, biological and endocrinological changes [9–12]. Steroid sex hormones play an active role in the development of periodontal diseases.

Estrogen levels are directly related to the conditions of the oral cavity. Post menopausal estrogen deficiency affects the immune system. Changes in the immune system make the individuals more susceptible to the development of periodontitis [13]. Periodontal regeneration refers to the complete restoration of the lost periodontal tissues [14] [14,15]. Post menopause women have a higher risk of periodontitis than premenopausal women [14–16]. This is consistent with the findings that the postmenopausal women have significantly higher plaque index than premenopausal women. This indicates the post menopausal women can have more severe periodontal destructions when compared to premenopausal women [14–17]. This menopausal symptom is a consequence of aging and is sometimes painless. Generally, the women who enter the stage of menopause experience discomfort in the oral cavity [14–18]. Previously our team had conducted numerous clinical trials and lab studies and in-vitro studies [19–34] over the past 5 years. The aim of the present study was to evaluate the periodontal health among premenopausal and post menopausal women.

MATERIALS AND METHODS

This study is a retrospective study based on a dental hospital setting with a varied population of samples predominantly South Indian Population. It is a single centred study with a small sample size. The study was carried out with Institutional Review Board (IRB) approval. Total number of sample size included 233 patients, who had visited Saveetha dental college, Chennai from June 2019 to April 2020. The inclusion criteria of the study was premenopausal women (aged 25 to 45 years) and post menopausal women (aged 55 to 75 years). Data collected includes age, menopausal status and different types of periodontal diseases.

The collected data was tabulated using excel spreadsheet and the data was analysed using SPSS software version 19. The statistical test used in this study was the Chi square test. p value less than 0.05 was considered to be statistically significant.

RESULTS AND DISCUSSION

Menopause is the turning point for the physical, emotional and psychological changes in the life of a woman. During this phase, various symptoms occur with variable degrees gradually occurring between the age group of 40 and 50 years. The steroid sex hormone levels, vary during the menopause period resulting in hormonal imbalance. ([35,36]. During the menopausal Transition phase,there is a decrease in the levels of estrogen, triggering inflammation thereby resulting in decreased physical functions[37]. The estrogen receptors are highly expressed in the periodontium, thus any hormonal imbalance in the premenopausal and post menopausal women significantly affects the periodontium [37,38] [37–39]. Generalised chronic periodontitis is a debilitating form of disease resulting in deteriorating effects on the esthetic and functional aspect of the oral cavity [37–40]. Natural menopausal age worldwide is 45 to 55 years. Estrogen deficiency causes oxidative stress thereby inducing periodontal damage [41]. Women have higher attachment loss than men. Hormonal fluctuations are common during the menopause period. Periodontitis occurs as a result of bacterial interaction with the host, which initiates the immune response and leads to loss of collagen support from the teeth and induce loss of alveolar bone, the latter which can lead to tooth mobility. Increased levels of pro-inflammatory mediators produce destruction of the periodontal tissues [42]. [43]. Periodontitis follows the inflammatory course of destruction of connective tissue, along

with presence of local irritants[43–45][35] [43–45] .

In the present study, 25 to 35 years of age were about (32.19%), 36 to 45 years (29.61%), 55 to 65 years (25.75%) and 66 to 75 years were about (12.45%) (Figure 1). Periodontal diseases are associated with variations in the female sex hormones ([46]. Most studies concluded it was due to the result of aging and hormonal variations in the individuals.

Generalised chronic periodontitis was most commonly present among postmenopausal women (35.19%). Generalised chronic gingivitis (51.07%) was more commonly seen in the premenopausal women (Figure 2) (p value= 0.00 <0.05) which is statistically significant. The study results show that the post menopausal women were commonly manifested with periodontal diseases. Generalised chronic periodontitis was most commonly seen in the age groups 55 to 65 years (23.18%) and 66 to 75 years (12.02%). Generalised chronic gingivitis was most commonly seen in the age groups 25 to 35 years (25.61%) and 36 to 45 years (24.46%) (Figure 3) (p value=0.00 <0.05) which is statistically significant.

According to the overall study results, the post menopausal women were commonly manifested with generalised chronic periodontitis compared to the premenopausal population. Previous literature stated that hormonal changes in the women were associated with changes in the periodontium. Periodontal diseases were reported as a strong predictor in the incidence of tooth loss [47]. Female sex hormones alters the periodontal tissue in response to bacterial plaque and therefore indirectly contributes to the development of periodontal disease [48]. Post menopausal women are at high risk of developing periodontal disease if proper oral hygiene is not practised [47,49]. The limitations of the study are less sample size and the systemic disease influence was not evaluated.

CONCLUSION

Generalised chronic periodontitis was most commonly seen among postmenopausal women of age group 55 to 65 years. Generalised chronic gingivitis was more commonly seen in the premenopausal women of age group 25 to 45 years. According to the overall study results, post menopausal women commonly had generalised chronic periodontitis compared to the premenopausal women population. The primary cause of periodontitis is presence of local factors and impaired immune response. The imbalance in oestrogen hormones during menopause is one of the major factors that contributes to periodontal damage.

AUTHOR CONTRIBUTIONS

Author 1 (Rithanya.P) carried out the retrospective study by collecting data and drafted the manuscript after performing the necessary statistical analysis. Author 2 (Dr.Balaji Ganesh S) aided in the conception of the topic, has participated in the study design, statistical analysis and has supervised in the preparation of the manuscript. Author 3 (Dr.Subhashree.R) has participated in the study design and has coordinated in developing the manuscript. All the authors have discussed the results and have contributed to the final manuscript.

CONFLICT OF INTEREST

None declared.

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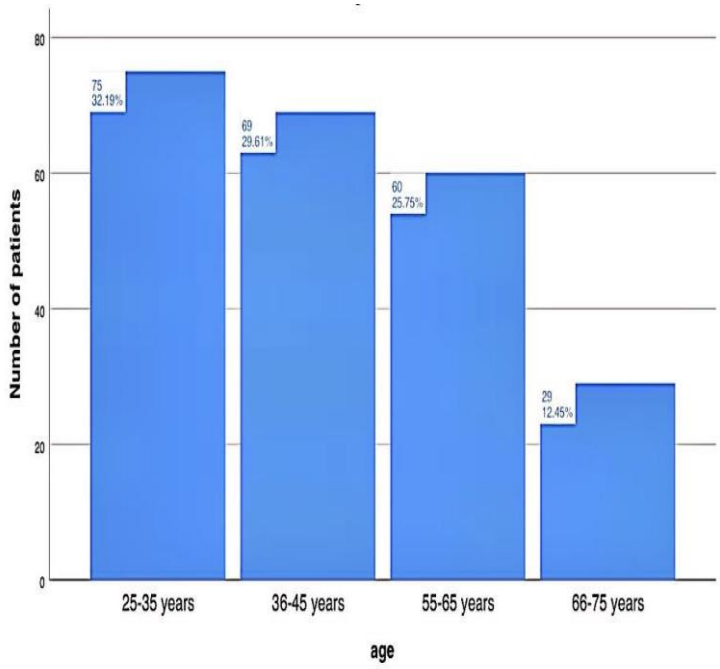

Figure 1: Bar chart depicting age groups in the study. X axis denotes the age groups and the Y axis denotes the number of patients in each group taken in the present study. 25 to 35 years of age were about (32.19%), 36 to 45 years (29.61%), 55-65 (25.75%) and 66 to 75 years were about (12.45%).

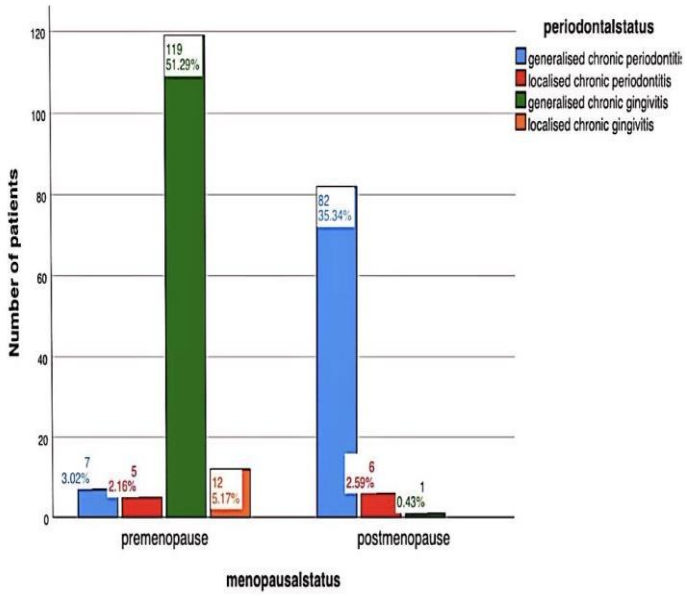

Figure 2: Bar chart depicting the association between the menopause status and the periodontal disease status. X axis denotes the menopausal status in the study groups and Y axis denotes the periodontal status of patients involved in the study. Generalised chronic periodontitis was common among post menopausal women and generalised chronic gingivitis was common in premenopausal women. Pearson's Chi square test value 189.926; df 3; p value= 0.00 (<0.05) which is statistically significant.

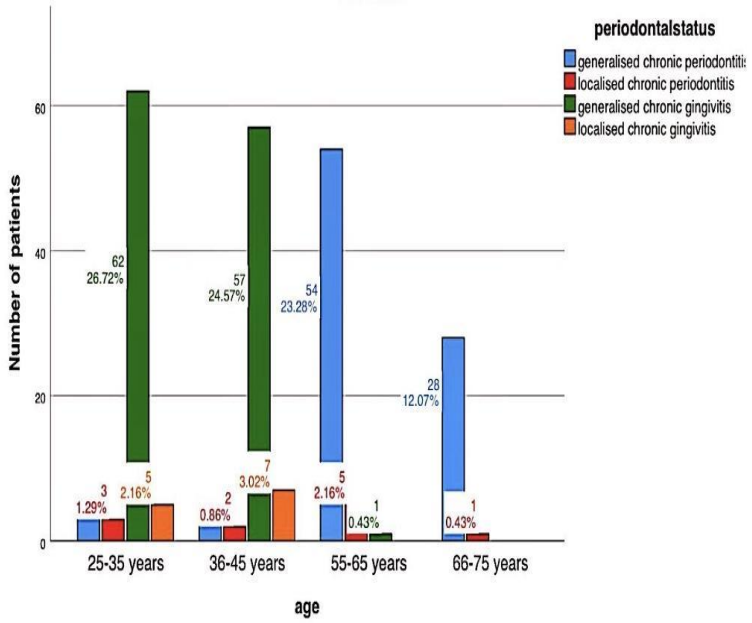

Figure 3: Bar chart depicting the association between the age groups and the periodontal disease status. X axis denotes age group. Y axis denotes the periodontal status of patients involved in the study, Generalised chronic periodontitis was most commonly seen in the age groups 55 to 65 years, Generalised chronic gingivitis was most commonly seen in the age groups 25 to 35 years . Pearson's Chi square test value 191.543; df 9; p value = 0.00 (<0.05) which is statistically significant.