ASSESSMENT OF FURCATION IN POSTMENOPAUSAL WOMEN WITH CHRONIC PERIODONTITIS - AN INSTITUTIONAL BASED RETROSPECTIVE STUDY.

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ABSTRACT

Menopause is associated with many systemic and oral changes. Many researchers have tried to evaluate the influence of hormonal changes associated with menopause in the periodontium. The aim of this study isto evaluate the furcation sites in postmenopausal women with chronic periodontitis. It is a single centered retrospective study. A total of 215 case records that met the inclusion criteria and were selected for the study. Patient records were collected and evaluated. The data analysis was done using SPSS software.Within the limits of the study, grade II furcations are more common compared to grade I, III and IV. Furcations are most commonly seen in 16,26,37,46 as compared to other molars. In relation to 46, grade II furcation was more common in the age group of 50-60 years, p value = 0.014 ⟨ 0.05 which was statistically significant. In relation to 47, Grade II furcation was more common in 50-55 years of age, p value =0.031⟨0.05, which is statistically significant. Post menopausal women are more prone to poor periodontal health status. There is a need to create awareness about periodontal health and the associated problems in postmenopausal women.

KEYWORDS: Age; Furcation; periodontal status; postmenopausal women.

INTRODUCTION

Periodontal diseases have high prevalence and can affect up to 90% of the world population. (Ramesh, Sheeja Saji Varghese, *et al.*, 2016) The chronic inflammatory state of periodontal destruction is caused by multiple etiology and risk factors.(Priyanka *et al.*, 2017) On the other hand, salivary flow rate decreases and salivary composition may be altered, contributing to the development of several oral conditions.(Yalçin, Gurgan and Gurgan, 2005) Inflammatory mediators and tissue breakdown products have been frequently detected in gingival tissues, gingival crevicular fluid, serum, and saliva.(Varghese *et al.*, 2015) Progression of the periodontal disease can further trigger the adaptive immune mechanism for release of inflammatory mediators resulting in further periodontal breakdown.(Mootha *et al.*, 2016)Endotoxin-1 plays a role in pathogenesis of various systemic diseases.(Khalid *et al.*, 2017) It plays a

role in the development of diseases such as respiratory infections, uncontrolled diabetes and severe osteopenia.(Khalid *et al.*, 2016)Periodontopathogens are also linked to systemic diseases like diabetes, cardiovascular problems and respiratory infections.(Ramesh, Sheeja S. Varghese, *et al.*, 2016) Periodontal problem can also be due to jaw deformities, altered passive eruption, or tooth malpositioning.(Ravi *et al.*, 2017)

Periodontal therapy has been directed primarily at elimination of the disease and maintenance of a functional, healthy dentition and supporting tissues.(Thamaraiselvan *et al.*, 2015) Periodontal diseases can be treated by both non surgical and surgical methods. Periodontal regeneration is a multifactorial process and requires a multi-dependent sequence of biological events, including cell-adhesion, migration, proliferation, and differentiation.(Panda *et al.*, 2014)As stem cells are characterized by their ability to self-renew and differentiate to produce specialized cells, there could be a possibility of using them for regenerative therapy for furcation.(Avinash, Malaippan and Dooraiswamy, 2017)Plasma rich in growth factors (PRGF) is a concentrated suspension of growth factors that promotes restoration of lost periodontal tissues. (Castro *et al.*, 2017) Chlorhexidine mouthwashes effective in the treatment of periodontitis.(Ramamurthy and Mg, 2018) Advanced and proper diagnostic images should be strongly recommended in evaluating the level of furcation for better treatment planning. (Kavarthapu and Thamaraiselvan, 2018; Ramesh *et al.*, 2019) The early diagnosis and treatment planning is important because tooth loss is an eventual complication associated with periodontal diseases.(Ramesh, Ravi and Kaarthikeyan, 2017)

Menopause is a natural decline in reproductive hormones when a woman reaches her 40s or 50s. It is associated with many important systemic and oral manifestations.(Vitiello, Naftolin and Taylor, 2007) During menopause the gingival epithelium becomes thinner, atrophic and more prone to inflammatory changes. They experience an increase in oral symptoms that results from endocrine disturbances, calcium and vitamin deficiencies and various psychological factors during post menopausal year.(Frutos *et al.*, 2002) The sudden decrease in oestrogen production that occurs in menopause is considered to be the main cause of primary osteoporosis, which also affects jaw bones. It has been suggested that reduction in bone density could contribute to periodontal disease progression.(Becker, 2006) Sign and symptoms of progressing periodontitis includes red swollen gingiva, persistent bad breath, pus discharge, loose or separating teeth.(Buencamino, Palomo and Thacker, 2009) The morphology of furcation is usually described by the entrance of the roof and its distance from the cementoenamel junction. Multiple systems are available to classify furcations. The most accepted and common system used for classification is based on the grade system which was given by Glickman in 1953.(Pilloni and Rojas, 2018) Grade I furcation involves the soft tissues and is the earliest stage of involvement. The pocket is suprabony, increased pocket depth may be present and radiographic changes usually not detected.in grade II, the furcation has a horizontal component, can be accompanied by a vertical defect , and is usually, although not always , radiographically visible. It can affect more of the furcations on the same tooth, although these defects do not connect to one other. With grade III furcation, the bone is attached to the roof or dome of furcations. Grade IV is when the soft tissue has receded and the interdental bone is destroyed. The aim of this study is to assess the furcation involvements in post menopausal women with chronic periodontitis reporting to Saveetha dental college, Chennai from june 2019 to march 2020.

MATERIALS AND METHOD

The current study is a single centered , observational retrospective study conducted in saveetha dental college and hospitals from june 2019 to march 2020. Ethical clearance was obtained from international review board inorder to undertake the study and carry out procedures to assess furcations in

postmenopausal women. The study included a sample size of 58 case records which fulfilled the inclusion and exclusion criteria, 215 case records out of 42110 case records were analysed from june 2019 to march 2020.

Selection of subjects - all the subjects taking part in the study were required to fulfill following inclusion criteria - Females, postmenopausal history, periodontitis. The exclusion criteria were past medical history, presence of systemic disease. Data was collected from the dental hospital management system which records all patient details in chronological order. The data collected was tabulated under patient ID number, name, age, grade I,II,III,IV furcations.

The data analysis was done using SPSS software (version 19). The chi square test and pearson correlation was performed to compare data and distributions at 0.05 level of statistical significance.

RESULTS AND DISCUSSION

A total of 215 postmenopausal women were recruited for the study on the basis of inclusion criteria for presence of furcations in first and second molars. The data obtained from the subjects has been summarised in form of bar charts and tables. Association between age and furcations in all molars did not have statistical significance.

The study results shows that grade II furcation in relation to 16 (16.3%), 17(13.5%), 26(15.8%), 27(11.6%), 36(16.3%), 37(16.7%), 46(17.7%) , 47(12.6) was more in all the age group compared to grade I,III,IV furcations (TABLE 1). Association of furcation in relation to 16,17,26,27,36,37 with age was not statistically significant.(FIGURE 1-6). In relation to 46, grade II furcation was more common in the age group of 50-60 years, p value = 0.014 ⟨0.05 which was statistically significant. In relation to 47, Grade II

furcation was more common in 50-55 years of age, p value =0.031⟨0.05, which is statistically significant. (FIGURE 7,8). In study conducted by M.C. Buencamino et al.,) 30.8% participants were reported with grade I and grade II furcation involvement.(Palomo *et al.*, 2013). In the study conducted by Bhat, SP1 et al., 43.8% subjects had Grade-II furcation involvement in postmenopausal women.(Bhat *et al.*, 2017)

In this study women in the age group of 50-65 years were more prone to furcations. The study results were statistically not significant, that is the p value was more than 0.05.Natural menopause is defined as a spontaneous cessation of natural menstruation for 12 consecutive months as above the age of 50. There are several hormonal changes taking place during menopause, as result the gingiva becomes more susceptible for accumulation of plaque and thus leading to much higher risk of gingivitis and advanced periodontitis.(Friedlander, 2002) Menopause results in oral health problems commonly because of lack of estrogen in their body. It favors the loss of alveolar bone of jaws, resulting in periodontal disease and loss of tooth.(Sasireka, Kurian and Ebenezer, 2013) Menopause can also affect bones throughout the body , reducing relative anchorage that the jaw has towards the teeth.

In this study, nearly all women had furcations in at least one molar irrespective of grade of furcation. But in general grade II furcation was more common followed by grade I furcation which indicates the periodontal health in post menopausal women is very poor which may result in loss of teeth. Post menopausal are not aware of their periodontal health , the risk for progressing disease or the risk of progressing disease to their systemic health. It is necessary for all the dentists to create awareness about the periodontal as well as complete oral health care in post menopausal women. Treating molar teeth with severe furcation that is grade IV presents a difficult challenge to the clinician though a number of treatments are available. Since the study population is limited to a single institution, the data should not be

compared with larger populations. Thus additional studies with larger sample size and longer periods of observations are needed in order to confirm the role of menopause on periodontal disease.

CONCLUSION

Within the study limits, grade II furcation was most common in women of age 50-70 years. Furcations are most commonly seen in 16,26,37,46 as compared to other molars. Post menopausal women are more prone to poor periodontal health status. There is a need to create awareness about periodontal health and the associated problems in postmenopausal women.

AUTHOR CONTRIBUTIONS

First author (Inchara.R) performed the analysis, and interpretation and wrote the manuscript.Second author (Dr. Balaji ganesh .S) contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Third author (Dr. Subhashree.R) participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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TABLES AND FIGURES

		GRADE I	GRADE II	GRADE III	GRADE IV
Furcation in 16	count	30	35	14	2
	Percentage	14.0%	16.3%	6.5%	0.9%
Furcation in 17	count	20	29	16	1
	Percentage	9,3%	13.5%	7.4%	0,5%
Furcation in 26	count	17	34	14	2
	Percentage	7.9%	15.8%	6.5%	0,9%
Furcation in 27	count	14	25	7	2
	Percentage	6.5%	11.6%	3.3%	0.9%
Furcation in 36	count	21	35	10	2
	Percentage	9.8%	16.3%	4.7%	0.9%
Furcation in 37	count	21	36	13	3
	Percentage	9.8%	16.7%	6.0%	1.4%
Furcation in 46	count	23	38	11	2
	Percentage	10.7	17.7%	5.1%	0.9%
Furcation in 47	count	15	27	7	6
	Percentage	7.0%	12.6%	3.3%	2.8%

TABLE 1- Depicting the frequency of furcations in individual molars and grades of furcation. In relation to all the molars Grade II furcation was more common compared to grade I,III,IV furcations in postmenopausal women.
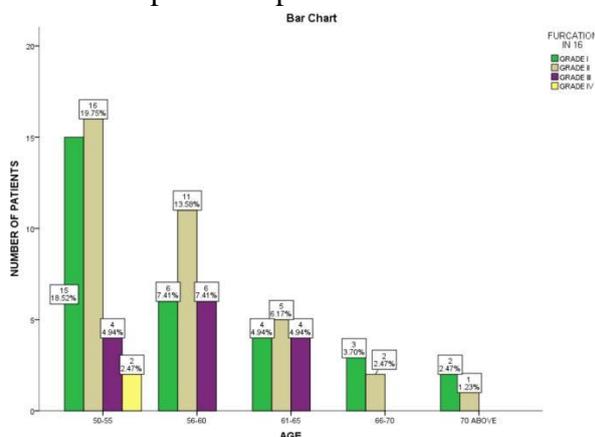

FIGURE 1 - Bar graph depicting association between age and furcation in 16. X- axis depicts the age of the patients and Y- axis depicts the number of patients with furcation in relation to 16. Green denotes grade I furcation, light brown denotes grade II furcation , purple denotes grade III furcation and yellow denotes grade IV furcation. Chi-square test was performed and association was not statistically significant.

Pearson chi square value;14.217[a] ; df ;16; p value = 0.583 >0.05 which is not statistically significant. Grade II furcations in relation to 16 was found to be more common in the age group of 50-55 years.
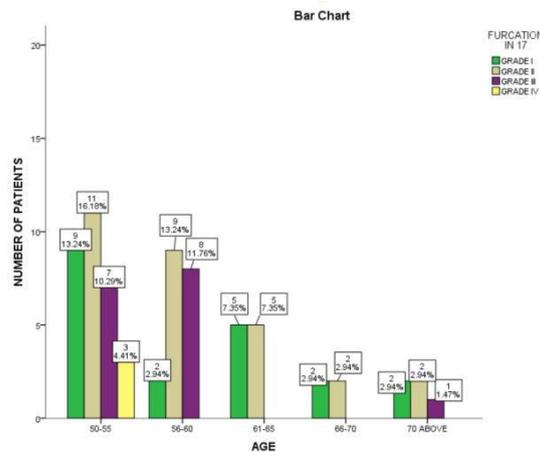

FIGURE 2 - Bar graph depicting association between age and furcation in 17. X- axis depicts the age of the patients and Y- axis depicts the number of patients with furcation in 17. Green denotes grade I furcation, light brown denotes grade II furcation , purple denotes grade III furcation and yellow denotes grade IV furcation. Using the Chi-square test the association was not statistically significant. Pearson chi square value ;18.208[a] ; df ;20; p value =0.415 >0.05 which is statistically not significant. In relation to 17, grade II furcation was more common followed by grade I furcation in the age group of 50-55 years.
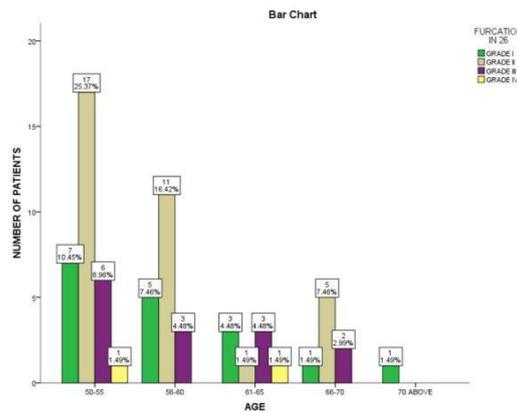

FIGURE 3 - Bar graph depicting association between age and furcation in 26. X- axis depicts the age of the patients and Y- axis depicts the number of patients with furcation in 26. Green denotes grade I furcation, light brown denotes grade II furcation , purple denotes grade III furcation and yellow denotes grade IV furcation. Using the Chi-square test the association was found to be not significant. Pearson chi square value ;18.268[a]; df;20; p value = 0.415 >0.05 which was not statistically significant. In the age group of 50-55 years, grade II furcations were observed to be more compared to other age groups.
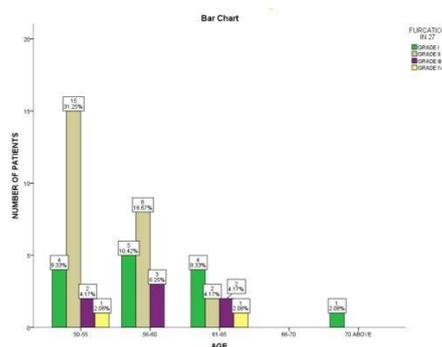
FIGURE 4 - Bar graph depicting association between age and furcation in 27. X- axis depicts the age of the patients and Y- axis depicts the number of patients with furcation in 27. Green denotes grade I furcation, light brown denotes grade II furcation , purple denotes grade III furcation and yellow denotes grade IV furcation.. With Chi square test it was found that association was not significant. Pearson chi square value ;18.209[a]; df;16; p value = 0.312 >0.05 which was not statistically significant. In relation to tooth number 27, in the age groups of 50-55years, grade II furcation was most common followed by grade I furcation.
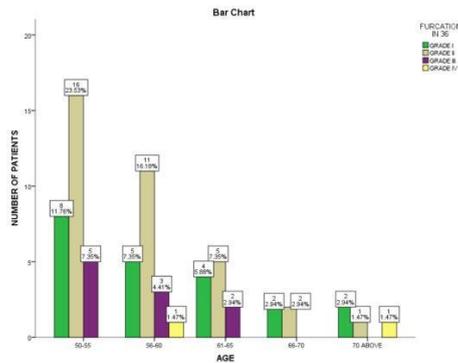

FIGURE 5 - Bar graph depicting association between age and furcation in 36. X- axis depicts the age of the patients and Y- axis depicts the number of patients with furcation in 36. Green denotes grade I furcation, light brown denotes grade II furcation , purple denotes grade III furcation and yellow denotes grade IV furcation. Using the Chi-square test the association was not significant . Pearson chi square value -13.518[a]; df-20; p value = 0.751 >0.05 which was not statistically significant. In relation to 36, in patients of age groups 50-70 years , grade II furcation was most common followed by grade I furcation.
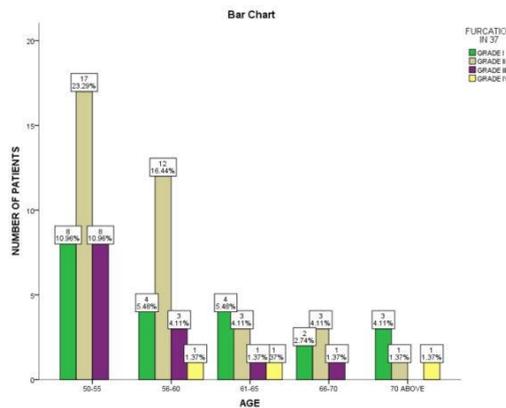

FIGURE 6 -Bar graph depicting association between age and furcation in 37. X- axis depicts the age of the patients and Y- axis depicts the number of patients with furcation in 37. Green denotes grade I furcation, light brown denotes grade II furcation , purple denotes grade III furcation and yellow denotes grade IV furcation. Using the Chi-square test the association was not significant . Pearson chi square value;15.057[a]; df;16; p value = 0.520>0.05 which was not statistically significant. In relation to 37, grade II furcation was more common in the age group of 50-70 years followed by grade I.
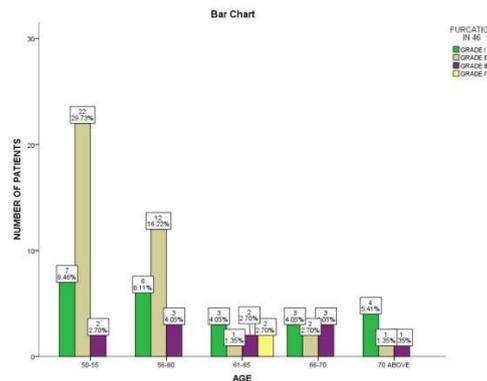
FIGURE 7 -Bar graph depicting association between age and furcation in 46. X-axis depicts the age of the patients and Y-axis depicts the number of patients with furcation in 46.Green denotes grade I furcation, light brown denotes grade II furcation , purple denotes grade III furcation and yellow denotes grade IV furcation.Using the Chi-square test the association was not significant. Pearson chi square value ;30.838[a]; df;16; p value = 0.014 ⟨0.05 which was statistically significant. In relation to 46, grade II furcation was more common in the age group of 50-60 years.
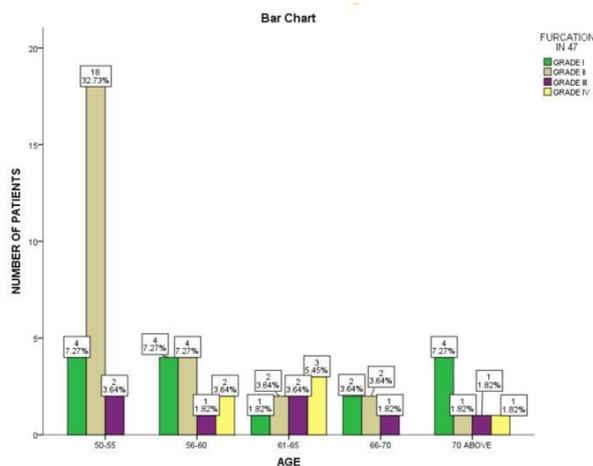

FIGURE 8 -Bar graph depicting association between age and furcation in 47. X- axis depicts the age of the patients and Y- axis depicts the number of patients with furcation in 47.Green denotes grade I furcation, light brown denotes grade II furcation , purple denotes grade III furcation and yellow denotes grade IV furcation. Using the Chi-square test the association was not statistically significant. Pearson chi square value ;28.071[a]; df;16; p value =0.031⟨0.05, which is statistically significant. Grade II furcation was more common in 50-55 years of age.

LEGENDS

TABLE 1 - Depicts frequency of furcations.

FIGURE 1 - Bar graph depicting association between age and furcation in 16.

FIGURE 2 - Bar graph depicting association between age and furcation in 17.

FIGURE 3 - Bar graph depicting association between age and furcation in 26.

FIGURE 4 - Bar graph depicting association between age and furcation in 27.

FIGURE 5 - Bar graph depicting association between age and furcation in 36.

FIGURE 6 -Bar graph depicting association between age and furcation in 37.

FIGURE 7 -Bar graph depicting association between age and furcation in 46.

FIGURE 8 -Bar graph depicting association between age and furcation in 47.