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PREVALENCE OF FURCATION INVOLVEMENT IN PATIENTS WITH CHRONIC PERIODONTITIS VISITING DENTAL COLLEGE- RETROSPECTIVE STUDY

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Abstract

The aim of the study is to assess the furcation involvement among chronic periodontitis patients visiting dental college. It was a retrospective study of patients reported to Saveetha Dental College And Hospitals, with periodontitis. Data was obtained by evaluating 86000 patients records. Out of which 72 patients with chronic periodontitis were evaluated in this study. Data extraction was done and was segregated based on demographic data age and gender. The periodontal parameters namely clinical attachment loss, probing depth and furcation involvement based on Glickman's classification were recorded. The data were collected and entered in the excel sheet. After data collection descriptive and inferential statistical analysis was done in IBM SPSS software version 20. This study shows that the most prevalent age group with furcation involvement in chronic periodontitis was 46-55 years. Males were more commonly affected than females. Prevalence of furcation involvement was found to be more in maxillary molar than in the mandibular molar. The most prevalent grade of furcation involved in the maxillary first molar is grade II. The association between the grade of furcation with age and gender was found to be statistically significant.

KEYWORDS*: Furcation, Periodontal patients, Probing depth.*

Introduction

Periodontitis is a chronic inflammatory response which is due to excessive microbial load including bacterial and viral origin ,aggravated by effect of proinflammatory cytokines like TNF alpha and interleukin I beta,[1–3]which leads to destruction of the bone around the tooth, progression of attachment loss and mobility.Furcation Involvement means loss of attachment, subsequent bone loss from progressive periodontal inflammatory disease At and around the bifurcation or trifurcation of the root.It is an important clinical sign in diagnosis of advanced periodontitis and also helps in determining the affected tooth prognosis[4,5]The condition takes place as a chronic course, it can include both the local and systemic factors of great importance(6].Assess the periodontal lesion in the furcation It's difficult for both the patient and the dental professionals and the treatment is of great challenge. The reason is that periodontium, once damaged, has a limited capacity for regeneration.Periodontal therapy has been directed primarily at the elimination of disease and maintenance of a functional, healthy dentition and supporting tissues. More recently however it has become increasingly focused on esthetic outcomes, which extend beyond tooth replacement and tooth color to include the soft tissues framing the dentition.

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Plaque does not just contain bacteria but it also contains viruses which can cause disease progression [7]Various risk factors that lead to the furcation environment that includes anatomic factors like cervical enamel projections, root trunk length , root divergence, root length, Root concavities ,narrow furcation entrance etc,pulp Infection, trauma from occlusion, age, smoking and a bad oral hygiene maintenance[8] Higher morbidity and compromised prognosis molars with for furcation Involvement have been reported in several retrospective studies of tooth loss[9]Similarly in a recent study it has been reported the association between Interleukin-21 levels with periodontitis[10]. ET-1 has also been identified in periodontal diseases [11,12]. Periodontitis can be associated with various systemic conditions[13].Presence of the furcation involvement is one of the clinical findings that helps in the diagnosis of advanced periodontitis[14]Disease progression occur due to the host-immune response to the bacteria, leading to the destruction of connective tissue and alveolar bone.

Furcation Problems increase with age, when the furcation becomes visible, the risk of losing the affected tooth increases.The frequently more common are the maxillary molar than mandibular molars[15]The furcation involvement are more prevalant among molars is that these teeth have complex anatomy and approachable to the non-surgical periodontal therapy. The meticulous oral hygiene maintenance and good plaque control measures serve as an effective mode of therapy [16]Treatment of the furcation involvement remains a clinical challenge, It is often hardly accessible for effective debridement,Since its entrance is very small for routine periodontal curettes To enter and adapt properly and they present with ridge and concavities that frequently interfere with instrumentation.[17] If the esthetics and function had to be restored dental implants and implant-supported prosthesis can be a predictable treatment modality in periodontal diseases [18].While performing surgical therapy trauma to the inferior alveolar nerve is one of the complications during surgical procedures in the posterior mandible[19].Herbal medicines and preparations can also be used for the management of periodontal diseases [20] The management for furcation is surgical therapy like free graft and pedicle flap are indicated when the furcation causes functional or esthetic problems.Coronally displaced flap is a treatment of choice for recession defects [21]Our team has worked on various regenerative therapy that has been indicated for periodontally compromised patients[22–24]and other treatments such as lip repositioning[25]

The aim of the study is to assess the furcation involvement in patients with chronic periodontitis visiting a dental college.

MATERIALS AND METHODS:

Study Setting:

The study was conducted with the approval of the Institutional Ethics Committee **[**SDC/SIHEC/2020/DIASDATA/0619-0320]. The study consisted of one reviewer, one assessor and one guide.

Study Design:

The study was designed to include all chronic periodontitis patients with furcation involvement. The patients who did not fall under this inclusion criteria were excluded.

Sampling technique:

The study was based on Retrospective study .To minimise the sampling bias, all the cases were reviewed priorly and included.

Data Collection And Tabulation:

Data collection was done using the patient database with the timeframe work of 1st June 2019 to 31st th March 2020. About 86000 patients databases were reviewed and those fitting under the inclusion criteria were included. Cross verification of data was done by a reviewer. The collected data was tabulated based on the following parameters:

- Patients demographic details
- Furcation grades in maxillary first molar(16) and mandibular first molar(36) based on Glickman's classification.

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- Clinical attachment loss
- Probing depth

Statistical Analysis:

The variables were coded and the data was imported to SPSS. Using SPSS Version 20.0 categorical variables were expressed in terms of frequency and percentage and bar graphs were plotted.The statistical significance of the associations were tested using the Chi-square test.

RESULTS:

This study shows that the most common age group with furcation is between 46-55 years and it is more prevalent in males than females.The most commonly involved maxillary tooth is 16 and mandibular tooth is 36.It was found that there is a correlation between grade of furcation in 16 with age (p value 0.007) and with gender (p value 0.031) in 16 and between age and grade of furcation in 36 showed (p value 0.05).Prevalence of furcation Was found to be more in maxillary tooth than in the mandible tooth.

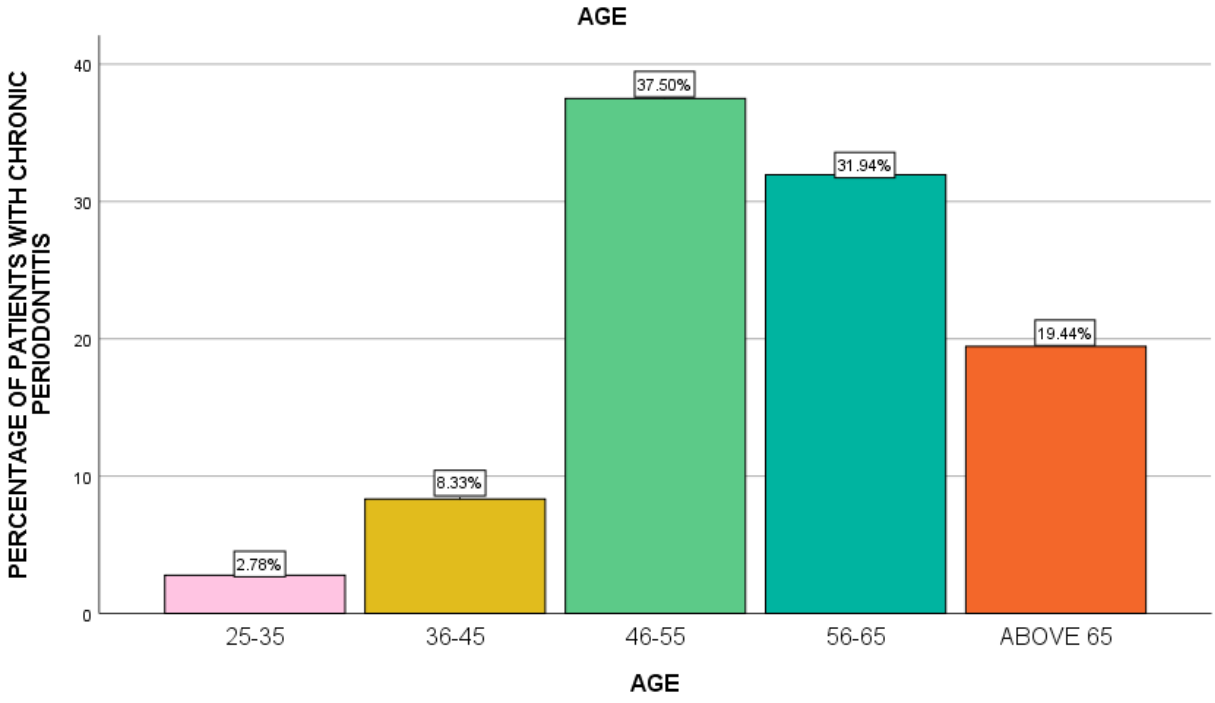

Figure 1: Bar graph depicting the distribution of age group among the study population.X axis represents the age group of the patients and Y axis represents the percentage of patients with chronic periodontitis.The most prevalent age group with chronic periodontitis and furcation involvement is seen between 46-55years.

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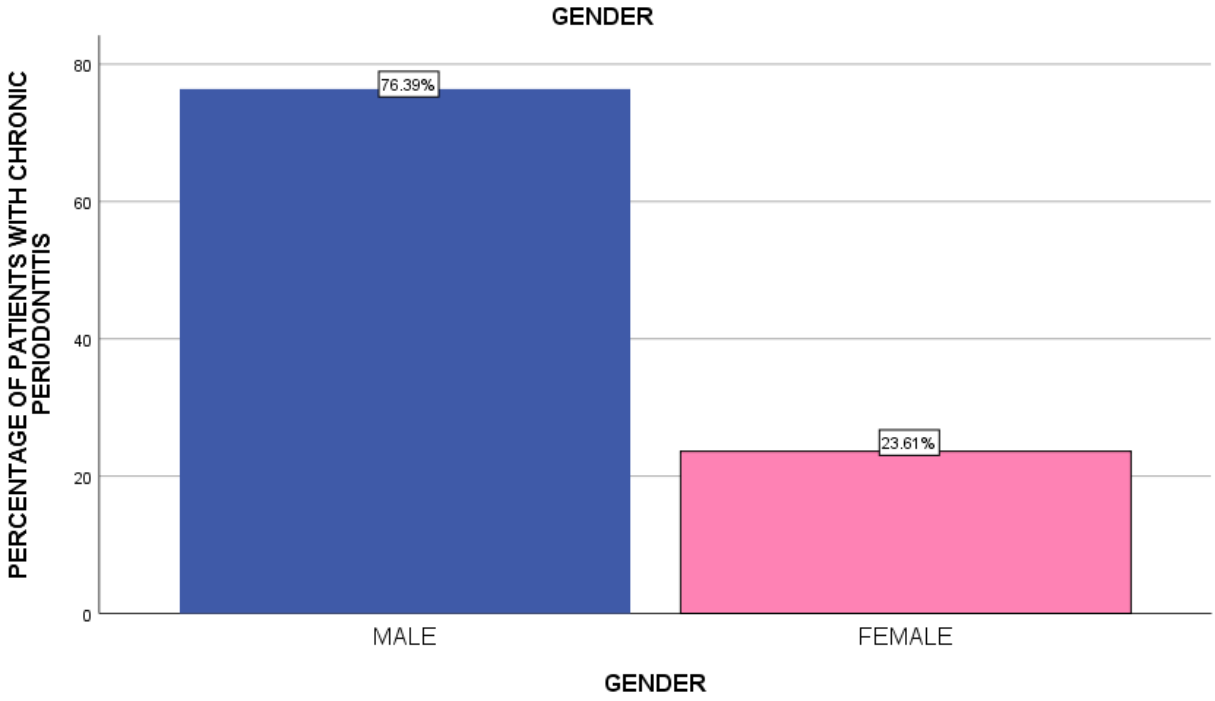

Figure 2: Bar graph depicting the distribution of gender among chronic periodontitis patients. X axis represents the gender of the patients and Y axis represents the percentage of patients with chronic periodontitis. From the figure we can infer that the majority of patients with chronic periodontitis and furcation involvement were males.

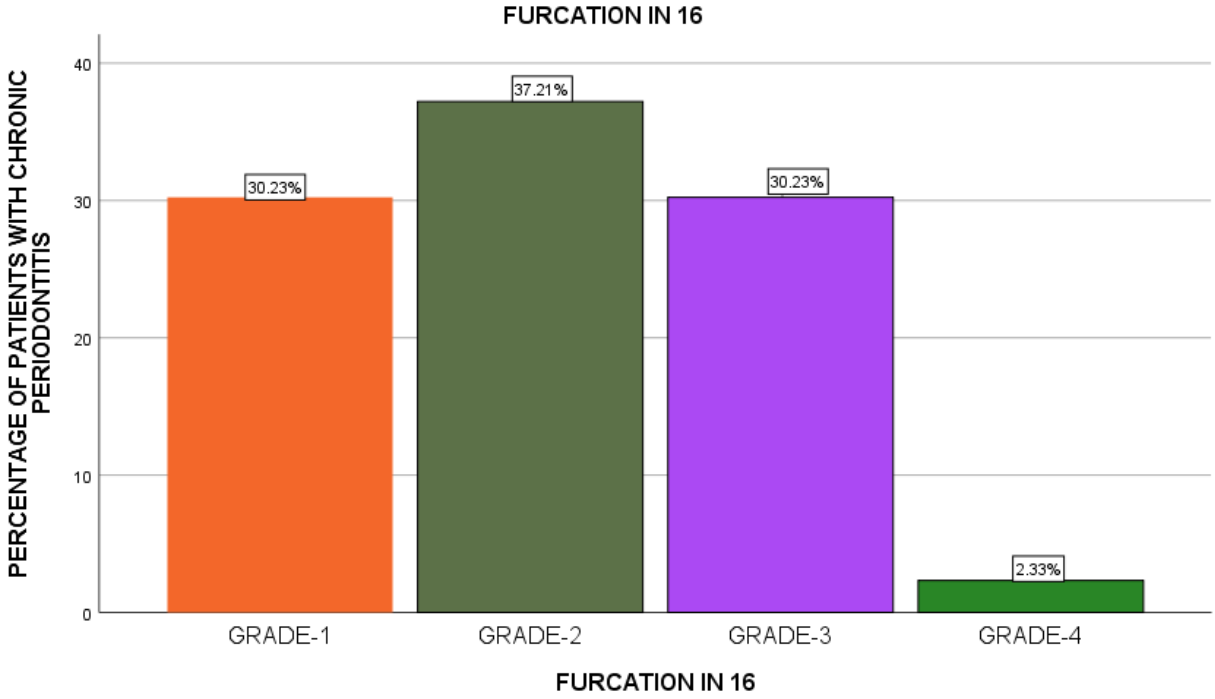

Figure 3: Bar graph depicting the distribution of furcation grades in 16 among the chronic periodontitis patients. X axis represents the grades of furcation involvement and Y axis represents the percentage of patients with chronic periodontitis. The most prevalent grade of furcation involvement in maxillary first molar (16) was grade II.

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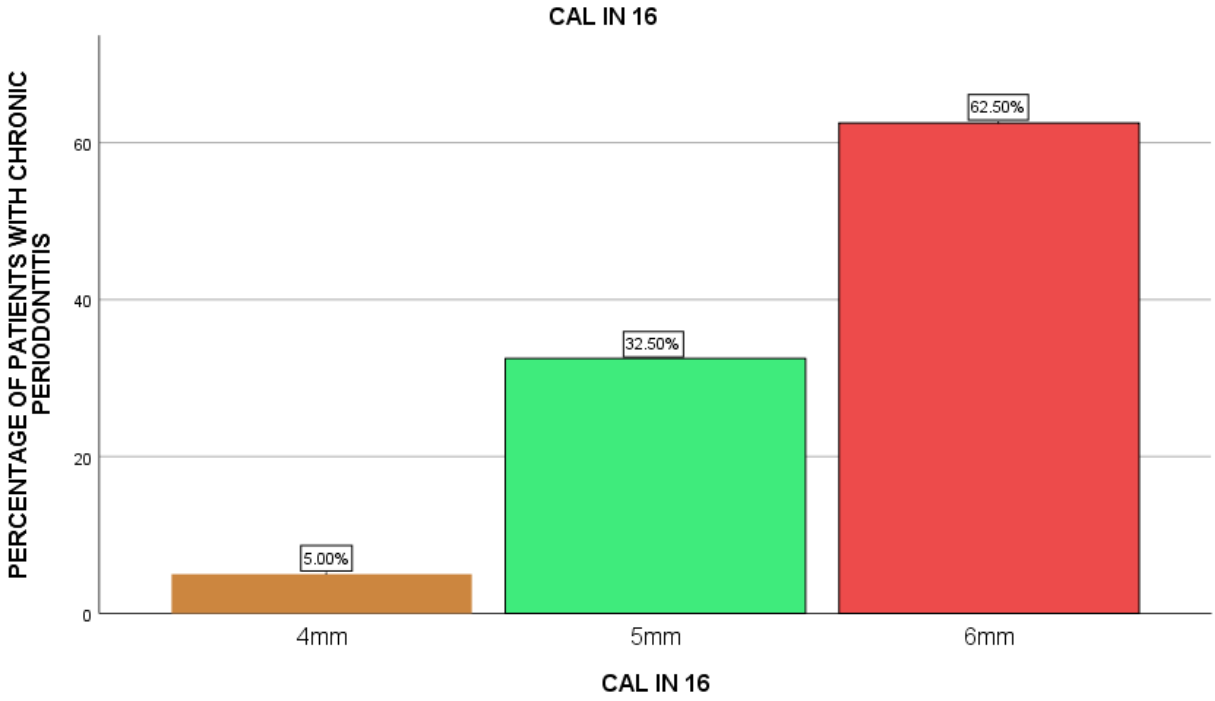

Figure 4: Bar graph depicting the distribution of clinical attachment (CAL) among the chronic periodontitis patients. X axis represents the clinical attachment loss in maxillary first molar and Y axis represents the percentage of patients with chronic periodontitis. From the figure we can infer that majority of the periodontitis patients with furcation involvement in maxillary first molar (16) had 6mm clinical attachment loss.

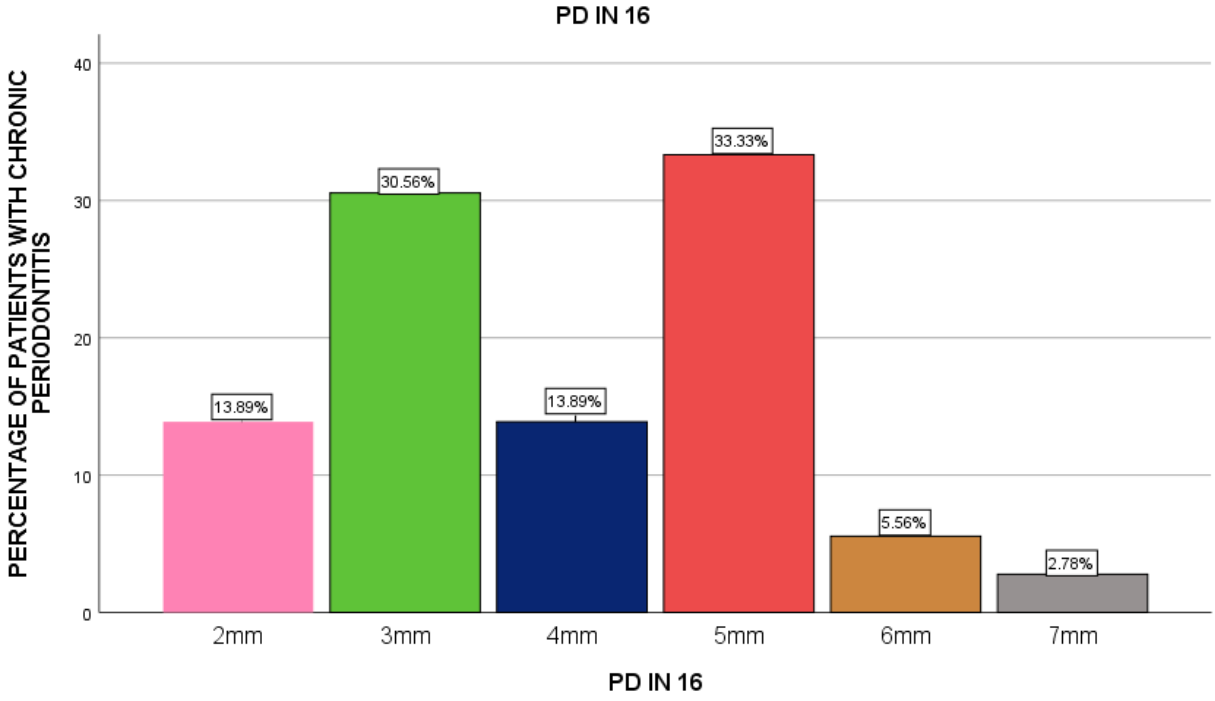

Figure 5: Bar graph depicting the distribution of probing depth (PD) among the chronic periodontitis patients. X axis represents the probing depth in maxillary first molar and Y axis represents the percentage of patients with chronic periodontitis. From the figure we can infer that the majority of the periodontitis patients with furcation involvement in maxillary first molar(16) had 5mm probing depth.

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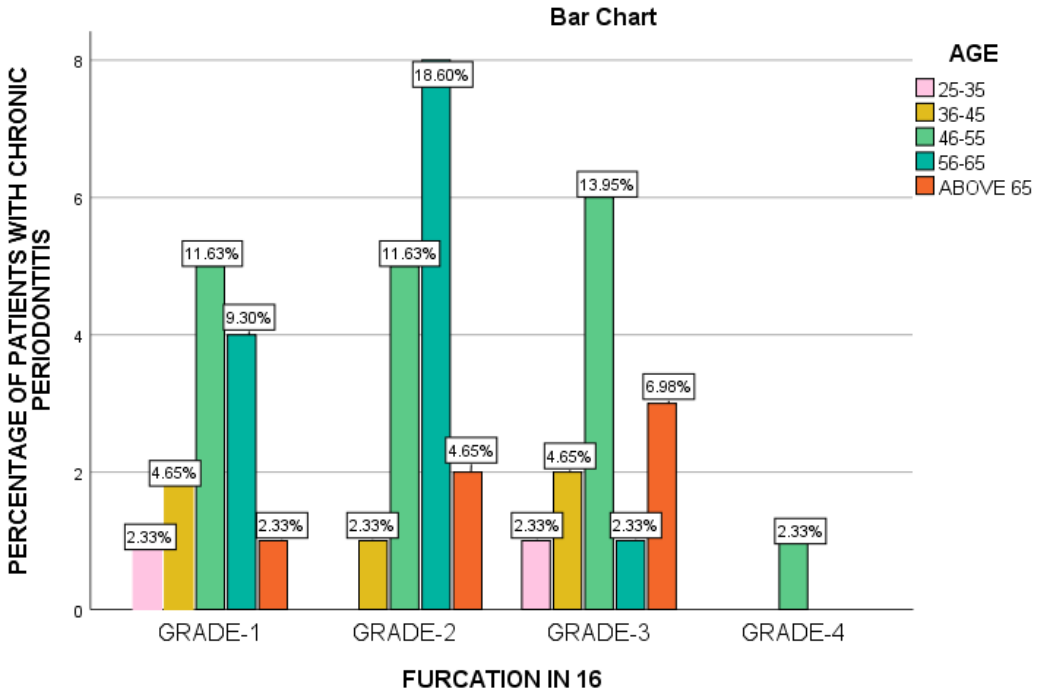

Figure 6: Bar graph depicting the association between the age group and the grade of furcation involvement in maxillary first molar. X axis represents the grades of furcation and Y axis represents percentage of patients with chronic periodontitis. Chi square test shows the p value 0.007 (p value <0.05) statistically significant. The most prevalent furcation involvement in maxillary first molar was grade II, and the association was statistically significant.

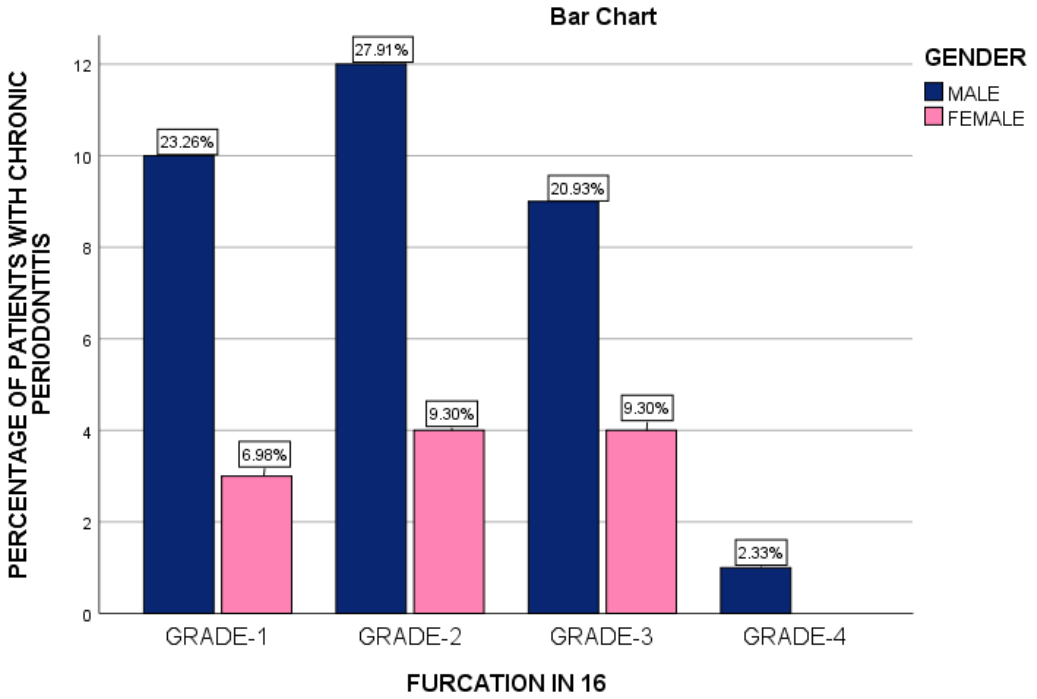

Figure 7: Bar graph depicting the association between the gender and the grade of furcation involvement in maxillary first molar. X axis represents the grades of furcation and Y axis represents percentage of patients with chronic periodontitis. It is inferred that the majority of male patients had grade 2 and female patients had grade 2 or grade 3 furcation involvement in 16. Chi square test shows the p value 0.031 (p value <0.05). The association was statistically significant.

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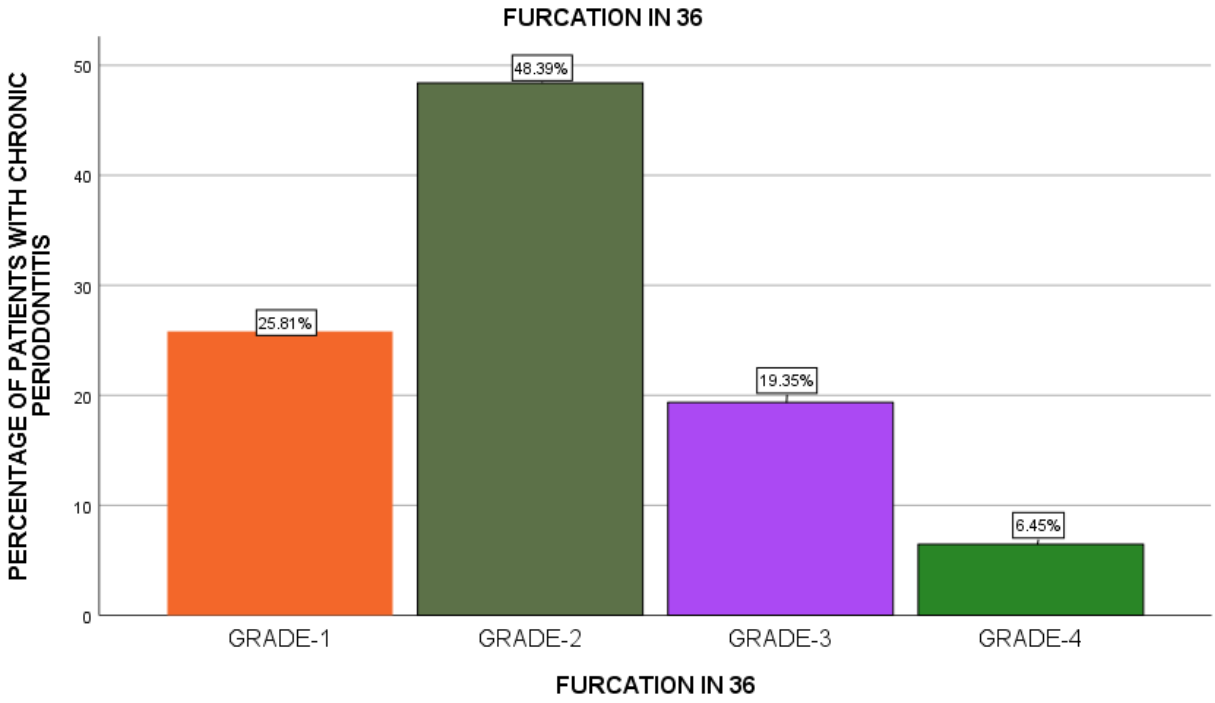

Figure 8: Bar graph depicting the distribution of furcation grades in mandibular first molar among the chronic periodontitis patients. X axis represents the furcation grades and Y axis represents the percentage of patients with chronic periodontitis. The most prevalent grade of furcation involvement in mandibular first molar (36) was grade II.

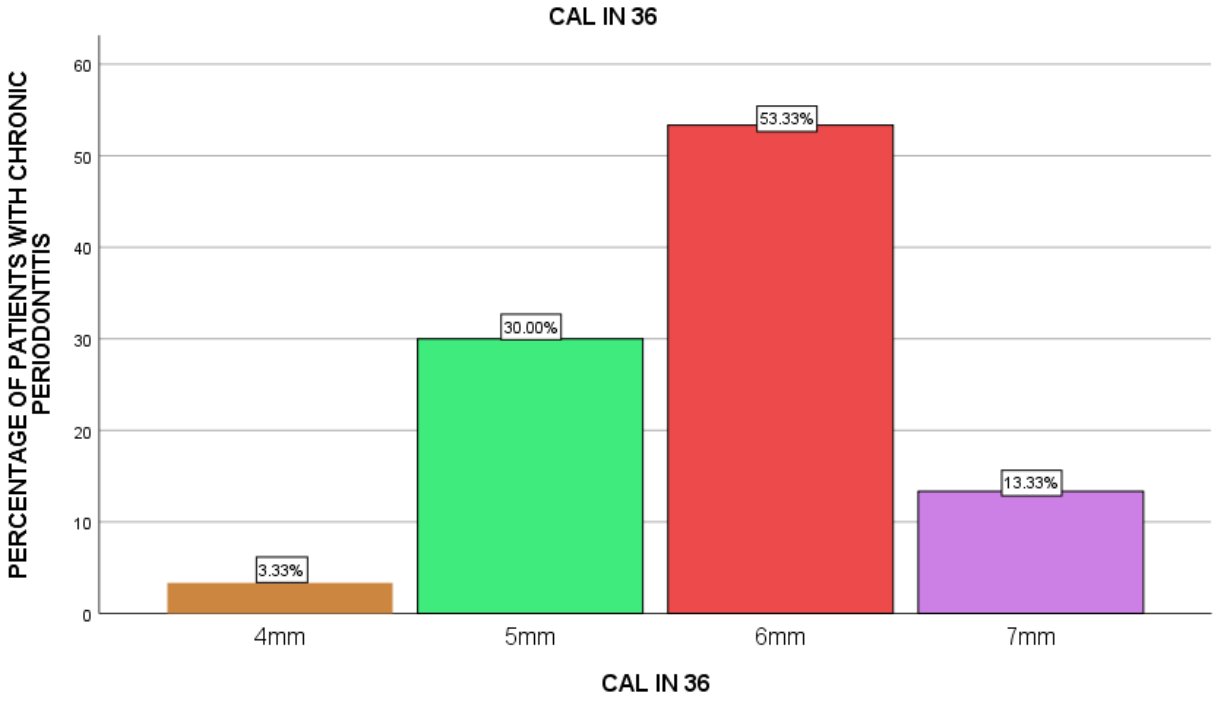

Figure 9: Bar graph depicting the distribution of clinical attachment loss in mandibular first molar among chronic periodontitis patients. X axis represents the clinical attachment loss and Y axis represents the percentage of patients with chronic periodontitis. From the figure we can infer that majority of the periodontitis patients with furcation involvement in mandibular first molar (36) had 6mm clinical attachment loss.

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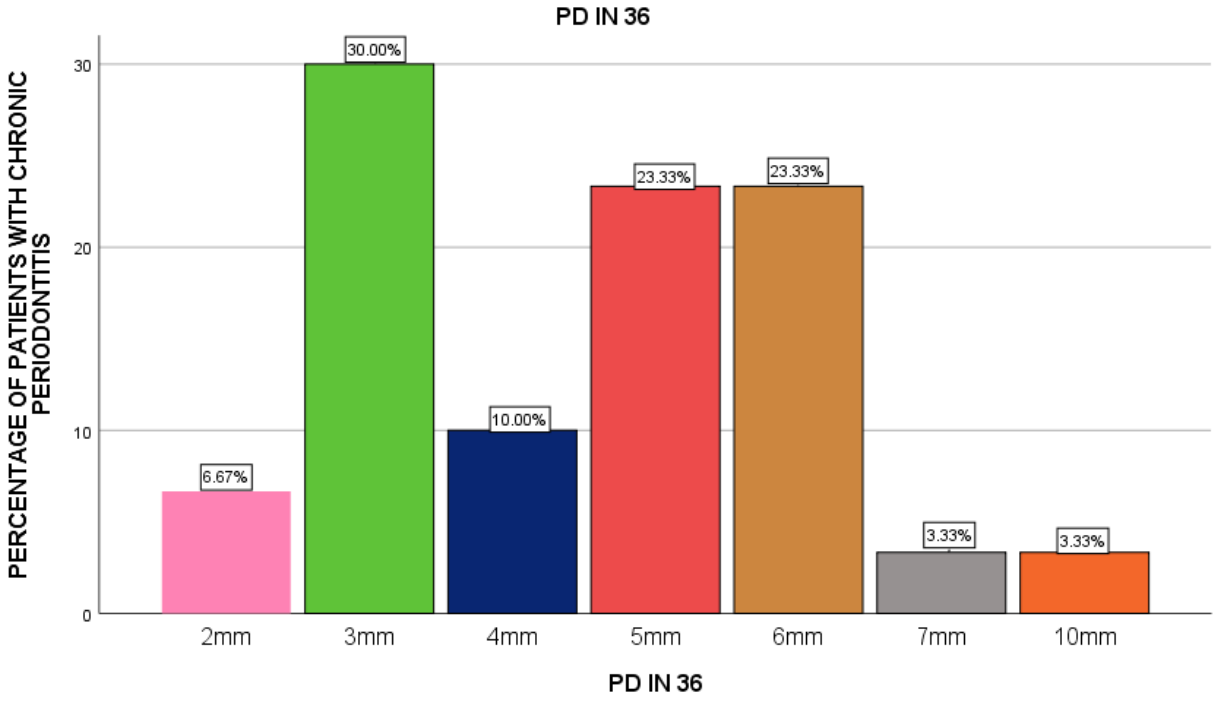

Figure 10: Bar graph depicting the distribution of probing depth in mandibular first molar among chronic periodontitis patients. X axis represents the probing depth noted in this study and Y axis represents the percentage of patients with chronic periodontitis. From the figure we can infer that majority of the periodontitis patients with furcation involvement in mandibular first molar (36) had 3mm probing depth.

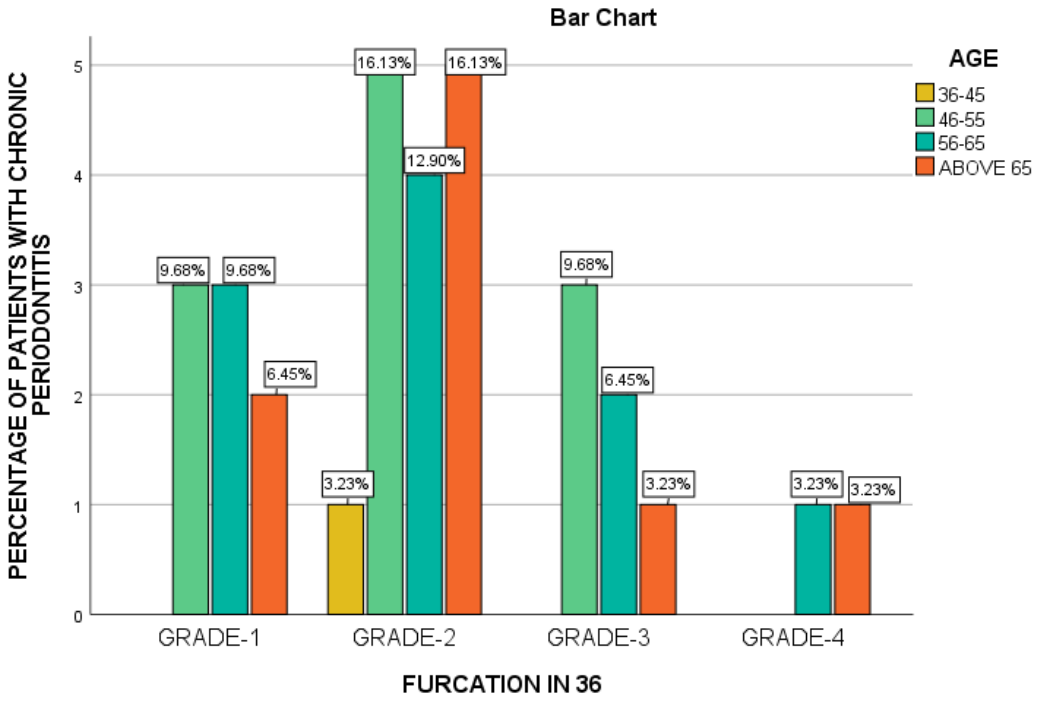

Figure 11: Bar graph depicting the association between the age and the grade of furcation involvement in mandibular first molar. X axis represents the grades of furcation in 36 and Y axis represents percentage of patients with chronic periodontitis.Chi square test shows the p value 0.05 (p value <0.05) statistically significant. From the figure we can infer that among all the age groups, the majority of patients with periodontitis had grade 2 furcation involvement, and the association was statistically significant.

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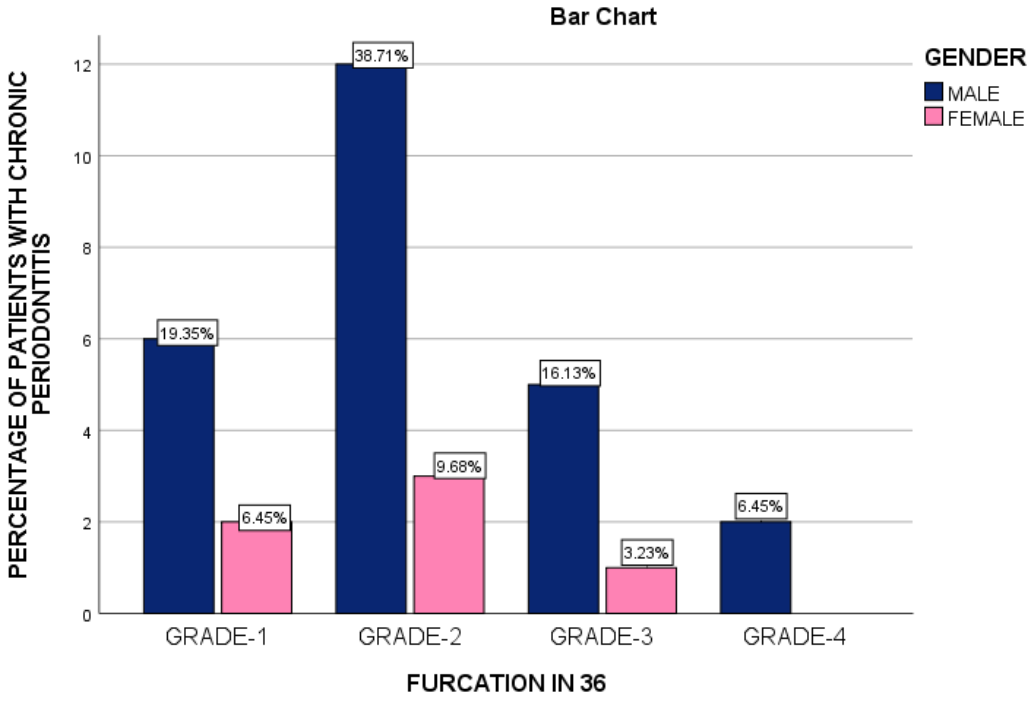

Figure 12: Bar graph depicting the association between the gender and the grade of furcation involvement in mandibular first molar(36). X axis - grades of furcation and Y axis - percentage of patients with chronic periodontitis. From the figure we can infer that the majority of male (blue) and female (pink) patients had grade 2 furcation involvement in 36. Chi square test, p value 0.470 (p value >0.05). However the analysis showed the association was statistically not significant.

DISCUSSION:

Patients who reported with periodontal disease were selected for this study.In this study prevalence of furcation Was found to be more in maxillary tooth (16) than in the mandible or tooth (36).The most prevalent gender affected with furcation is males 76.39% than females 23.61%.(Figure 2)Previous study showed the prevalence of furcation involvement in 222 patients who had been referred for the treatment of periodontitis.The prevalence of furcation Involved molars was higher in maxilla than mandible.the result appeared to be in agreement with the study[(26)].

More prevalent age group was seen between 46 to 55 years followed by 25-35 years 2.78%, 36-45 years 8.33%, 56-65 years 31.94% and above 65 years it is 19.44%.(Figure 1) In maxillary molar (16) the maximum involved grade is grade II (37.21%) followed by grade I,III (30.23%) and grade IV (2.33%).(Figure 3) The attachment loss was found to be of about 6mm (62.5%) maximum followed by 5mm (32.50) and 4mm (5%).(Figure 4) The maximum value of pocket depth seen is about 5mm (33.3%) followed by 3mm (30.56%), 2mm, 3mm (13.89%),6mm (5.56%) and 7mm 2.78%.(Figure 5)

(Figure 6) shows the association between the age group and the grade of furcation involvement in maxillary first molar (16).There is a significant increase in grades of furcation as age increases. The P Value <0.05(chi square value) was statistically significant.(0.007).(Figure 7) shows the association between the gender and the grade of furcation involvement in 16.There is a significant increase in grades of furcation in male when compared to females. The P Value <0.05(chi square value) was statistically significant.(0.031)

In mandibular molar (36) the maximum involved grade is grade II (48.39%) followed by grade I (25.81%),grade III (19.35%)and grade IV (6.45%).(Figure 8) The attachment loss was found to be of about 6mm (53.33%) maximum followed by 5mm (30%), 7mm (13.33%) and 4mm (3.33%).(Figure 9) The maximum value of pocket depth seen is about 3mm (30%) followed by 5mm ,6mm(23.33%), 2mm (10%),2mm (6.67%), 7mm and 10mm (3.3%).(Figure 10)

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(Figure 11) shows the association between the age and the grade of furcation involvement in 36..There is a significant increase in grades of furcation as age increases. The P Value <0.05(chi square value) was statistically significant.(0.05). (Figure 12) shows the association between the gender and the grade of furcation involvement in mandibular first molar (36).There is a significant increase in grades of furcation in male when compared to females. The P Value >0.05(chi square value) was statistically not significant.(0.470)

There are multiple factors which are involved in the progression of the furcation involvement which includes smoking, age, dental plaque, gingival inflammation. Plaque is the initial factor for all the inflammatory changes in the periodontal tissue.And epidemiological study which was carried out in USA showed pocket death, attachment level and furcation involvement increases with age.Education and socio-economic status have a relatable impact on periodontal status (27)

The limitation of the study was the limited sample size and it doesn't include the ethinic group. It was a single centered study.The future scope of the study is that a prospective study can be performed with a larger population.

CONCLUSION

Within the limits of the present study, it was concluded that the most common age group that was affected with furcation was between 46-55years. Males were more commonly affected than females. The most common type of furcation grades involved in both 16 and 36 was Grade II. There was an association between the grade of furcation in 16 with age, and with gender. Considering 36 there was an association between age and grade of furcation. Prevalence of furcation involvement was found to be more in maxillary tooth than in the mandible tooth.

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AUTHORS CONTRIBUTION

G.Nithya Karpagam , Dr Shankari Malaiappan were the main contributors to the concept, design, literature analysis, workshop discussions, and drafting and revising manuscript. Dr Shankari Malaiappan and Dr Dinesh Prabu contributed to drafting and revising manuscripts. All authors gave final approval of the version to be published.

CONFLICTS OF INTEREST

There were no conflicts of interest.

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