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Prevalence of Dental Plaque among Adults Attending Private Dental College in Chennai City- A Descriptive Study

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Abstract

Dental plaque is the community of micro organism found on a tooth surface as a biofilm, embedded in a matrix of polymers of host and bacterial origins of clinical relevance is that fact that biofilms are less susceptible to antimicrobial agents, while microbial communities can display enhanced pathogenicity. There are certain plaque induced oral diseases like chronic gingivitis, gingival enlargement, recurrent gingivitis,periodontitis. The Dental Plaque index was introduced to determine better oral hygiene by grading the dental plaque accordingly the present study was designed to assess prevalence of dental plaque among adults visiting saveetha dental college.Case sheets of all the patients of OP Department of Saveetha Dental College for the period of two months(Dec 2019- Jan 2020) were reviewed from patient record. Among their reviewed data, 388 appropriate study samples were selected and tabulated in MS excel.Then the tabulated data were transferred to statistical software SPSS Version 20.O. Descriptive statistics were expressed by means of frequency and percentage. Independent t test was used to compare the Mean Plaque index based on Gender and One way ANOVA was used to compare the Mean Plaque index based on age groups. A statistically significant difference was observed between the selected age groups which shows that the mean Plaque Index score was found to be high among participants aged more than 45 years. Even Though there was no significant difference on comparison of mean Plaque Index score based on Gender, the Plaque was found to be more prevalent among female participants than males.Within the limits of study, the prevalence of dental plaque was high among participants aged more than 45 years and females had a higher Mean Plaque Index score than males.

Keywords*- Dental plaque;plaque index; micro organisms; poor oral hygiene.*

Introduction

Dental plaque is the community of microorganisms found on a tooth surface as a biofilm, embedded in a matrix of polymers of host and bacterial origin [1,2] of clinical relevance is that biofilms are less susceptible to antimicrobial agents,while microbial communities can display enhanced pathogenicity[3]. The structure of the plaque biofilm might restrict the penetration of antimicrobial agents, while bacteria growing on a surface grow slowly and display a novel phenotype , one consequence of which is a reduced sensitivity to inhibitors[4].

Plaque is natural and contributes like the resident microflora of all other sites of the body to the normal development of the physiology and defenses of the host[5,6]. Irritant extraneous substances that are sick to the tooth

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surface include bacterial plaques, dental calculi,residual proteins from food and cloured substances , among which dental plaques and dental calculi are the most important localized causes of periodontal disease [7,8].

Accumulation of plaque can cause the rapid onset of gingivitis and long term exposure to plaque can lead to the loss of periodontal attachment and bone support.Long term exposure to plaque also can lead to the demineralization and destruction of the teeth through caries [9–11]. Removal of plaque is an effective way to help prevent periodontal disease and caries,but if deposits remain on the teeth across time, destruction periodontal disease,caries or both may occur [12].Main factor of both the disease is deposits and bacterial dental plaque accumulation on the tooth surface [13,14]. Thus, regular removal of dental plaque from the tooth surface by both personal oral hygiene practices such as tooth brushing and professional periodontal treatment are the most important steps of oral care [15-16,17]. Periodontal therapy starts by training the patient on oral hygiene and mechanical removal of deposits from the tooth surface [18]. Following the mechanical periodontal treatment it is very important to sustain individual oral hygiene practice in terms of maintenance of dental and periodontal health [19,20]. Thus, it is obligatory to raise consciousness about appropriate plaque control by teaching the patients oral hygiene practice in terms of either success of treatment, maintenance of oral health [21].

Additional research has elaborated on the influences of other factors, including diet,local oxygen tension,salivary factors, tooth position and disaster [22], all of which influences dental plaque accumulation [23–26] Other variables, influencing plaque accumulation include caries, which is also one of the important dental diseases causing tooth loss in adult humans. Practices of preventive dentistry making dental plaque control a habit, is enabled through patients motivation [27]. Despite motivation and training, the properties of patients regarding dental plaque control might get back to pretreatment level in because of time and may not apply what had been taught until the patient goes for a session [28].

Even though the patient has very good motivation in the beginning , the patient's efforts concerning daily oral care might decrease in time. Thus it is important for continuation of oral health to determine motivation level of patients at intervals during active periodontal treatment and periodical session, and continue motivation programs by taking time into consideration to reduce the plaque control and reduce occurrence of periodontal disease [29,30]. Aim of the study is to assess the prevalence of dental plaque among adults attending dental college of chennai city.

Materials and Methods

The present record based, descriptive study was conducted among patients reporting to the OP of Saveetha Dental College with dental plaque. Case sheets of all the Patients of OP Department of Saveetha dental college were reviewed for a period of two months [JUNE 2019 and MARCH 2020]. Simple Random Sampling was carried out to select a total of 388 patients. The descriptive study was done by two examiners and the approval for this study was obtained from the Institutional ethics committee,Saveetha University.

Assessment of dental plaque was carried out by plaque index(PI) by Silness P and Loe H(1964). A score of 0 was assigned when no plaque is present, a score of 1 was assigned when a thin film of plaque adhering to the free gingival margin and adjacent area of the tooth, a score of 2 was assigned when moderate accumulation of plaque within the gingival pocket and adjacent tooth surfaces, a score of 3 was assigned when there is a abundance of soft matter within the gingival pocket.

The data assessed and tabulated were age,gender,plaque index score.Later obtained data were tabulated and entered in the MS excel sheet. The data was imported to SPSS version 20.O and the variable definition process was done by using tables and graphical illustration.The results were expressed by means,standard deviation & percentage Descriptive statistics were expressed by means of frequency and percentage. Independent t test was used to compare the Mean Plaque index based on Gender and One way ANOVA was used to compare the Mean Plaque index based on age groups.. The level of statistical significance was set at a value $P<0.05$

Results And Discussion

The study sample consisted of 388 cases of which 21.9% of the subjects are 18-25 years old, 37.7% of the

subjects were 26-35 years old, 18.9% of the subjects are 36-45 years old and 21.4% of the subjects are > 45 years old and (refer Fig 1).Out of of 388 study participants, 58.9% were females and 41.3% were males (refer Figure 2).

Comparing the Mean Plaque index and Age of the study subjects . The mean Plaque index score for the subjects between 18 to 25 yrs, 26 - 35 yrs, 36-45 yrs and above 45 years age group were 0.96 ± 0.89, 0.97± 0.46, 1.02± 0.51 and 1.28± 0.62 respectively. One way ANOVA was used to find the difference between the different age groups with respect to Mean Plaque index and was found to be statistically significant (F value- 5.14; $p<0.05$) which signifies that study subjects in the age group above 45 years had a higher Mean Plaque index score when compared to other groups (refer Figure 3).

Comparison between Mean Plaque index and Gender Of the study subjects . The mean Plaque index score score for male and female study subjects were 0.96 ± 0.89, 0.98± 0.46 and 1.09± 0.73 respectively. Independent t test was used to find the difference between the male and female subjects with respect to Mean Plaque index and was found to be statistically insignificant (t value- 1.65; $p>0.05$). Even though the test was found to be statistically insignificant, female study subjects had a higher mean Plaque index score compared to male study subjects(refer Figure 4).

According to this study, there were a total of 388 patients who reported to the OP during december 2109-january 2020 of saveetha dental college.Out of which 21% of the patients were in the age group of 18-25 years, 37% in 26-35 years, 18% in 36-45 years and <45 years is about 21%. Distribution of patients based on gender and recovered with plaque index were 60% of males and 40% females were recorded.

According to Rizwan M sanodi et al [31]There was much awareness about oral health and hygiene however awareness about oral health and hygiene however makes it more prevalent to dental plaque in this study it is proven females are also prone to dental plaque, most likely age group above 50 years seems to have poor oral hygiene.

According to Sreenivasan et al [32]., dental plaque is significantly high in women,who maintain poor oral hygiene and have severe periodontal disease. According to Schaeken MJ et al [33].,In this study it is said that an increase in salivary secretion causes dental plaque formation which eventually helps bacteria to grow. According to Antina Schulze and martin busse [34].,systemic disease also causes significant increase of dental plaque in women, according to their study type 2 diabetic patients who are women are more prone to periodontal infection and disease which shows significant dental plaque in women.

In a study done by AL Ansari [35]et al., the prevalence of plaque induced gingivitis shows the result that males are more prevalent to gingivitis as well as the central plaque.Opposing studies may also be present accordingly to know better significance and results.According to Addy M et al [36].,The prevalence of dental plaque is significant in posterior teeths than the anterior due to food accumulation and poor brushing technique and the study also proves plaque index helps in appropriate scoring of dental plaque. According to Marakami et al [37]., the prevalence of dental plaque induced gingival conditions are common in females with post menstrual problem or any other hormone related problems,which can alter the severity of the plaque induced inflammation.Which may lead to attachment loss of alveolar bone and which significant loss of teeth.Moreover, most of the studies compared above,proves that prevalence of dental plaque in female population, there are also opposing studies to prove makes are more prone to dental plaque .But still in this study the p value is significant to prove that females are more prone to dental plaque, though current study possess few limitations such as very small sample size.

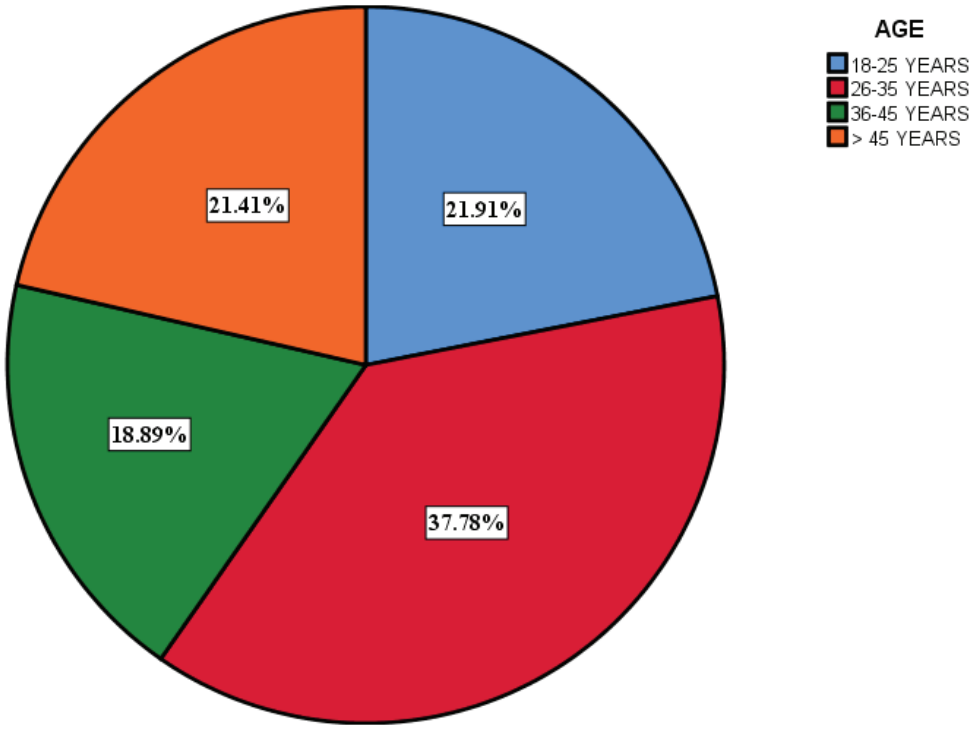

Figure 1- The pie chart represents the distribution of study subjects based on age. 21.9% of the study subjects were distributed in the age group between 18-25 years which is denoted by blue colour, 37.7% of the study subjects belongs to 26-35years of age group denoted by red colour , 21.9% constitute to age group between 36-45years denoted by green colour and 21.4% constitute study subjects above 45 years old denoted by orange.

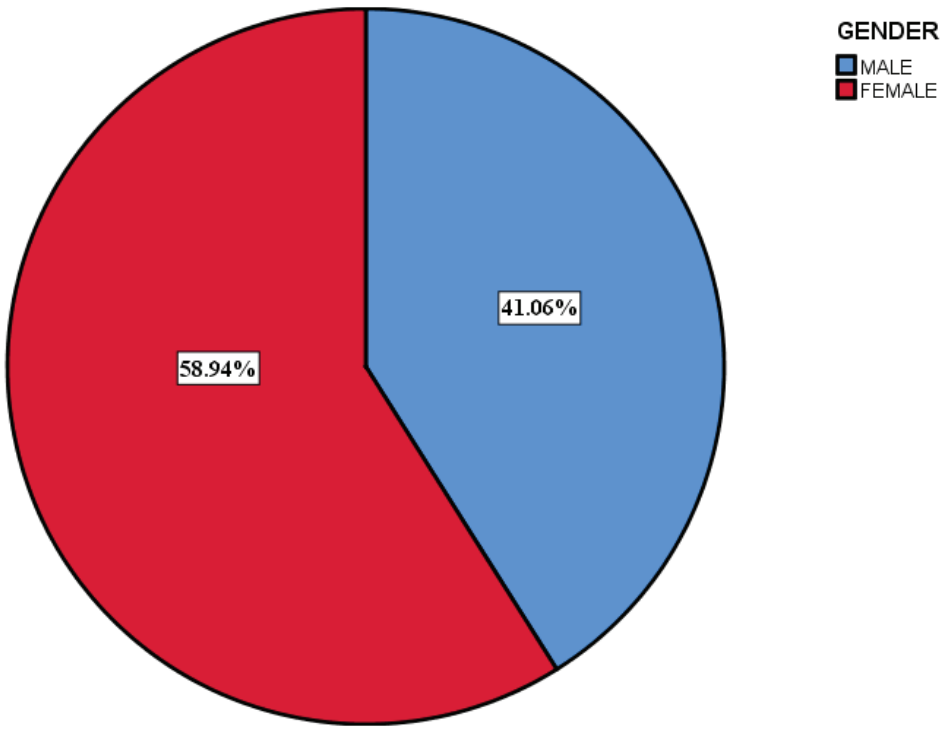

Figure 2- Pie chart represents distribution of study subjects based on Gender, where blue colour denotes male which is about 41.06% and red colour denotes females which is about 58.94%.

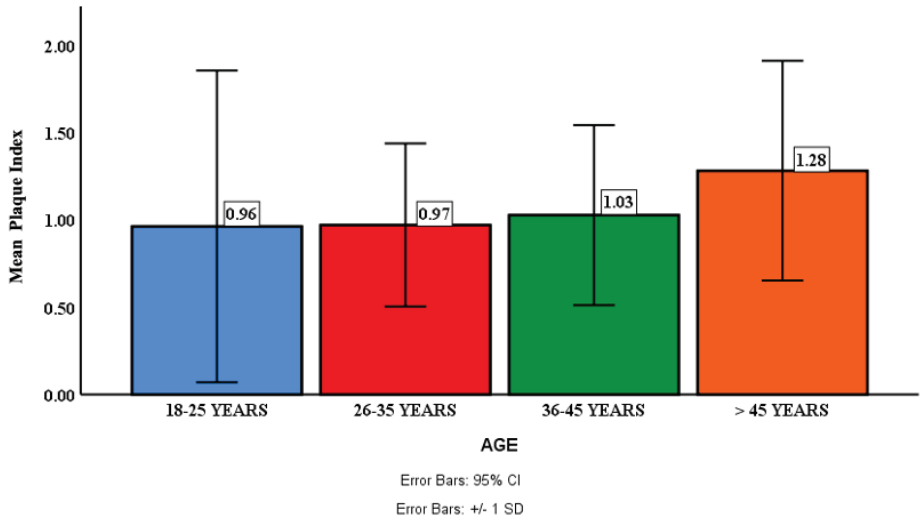

FIGURE 3 : The bar graph represents the Comparison between Mean Plaque index and Age of the study subjects . The mean Plaque index score for the subjects between 18 to 25 yrs, 26 - 35 yrs, 36-45 yrs and above 45 years age group were 0.96 ± 0.89, 0.97± 0.46, 1.02± 0.51 and 1.28± 0.62 respectively. One way ANOVA was used to find the difference between the different age groups with respect to Mean Plaque index and was found to be statistically significant (F value- 5.14; p<0.05) which signifies that study subjects in the age group above 45 years had a higher Mean Plaque index score when compared to other groups.

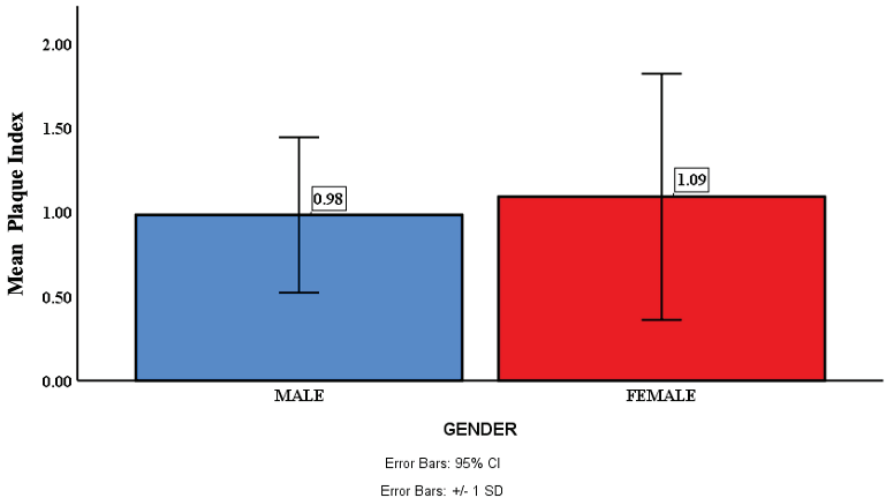

FIGURE 4 : The bar graph represents the Comparison between Mean Plaque index and Gender of the study subjects . The mean Plaque index score score for male and female study subjects were 0.96 ± 0.89, 0.98± 0.46 and 1.09± 0.73 respectively. Independent t test was used to find the difference between the male and female subjects with respect to Mean Plaque index and was found to be statistically insignificant (t value- 1.65; p>0.05). Even though the test was found to be statistically insignificant, female study subjects had a higher mean Plaque index score compared to male study subjects.

Conclusion

The prevalence of dental plaque was high among participants aged more than 45 years and females had a higher Mean Plaque Index score than males.Poor oral hygiene and systemic disease and also few other food habits causes females prone to plaque.Further measurements can be taken to control dental plaque by maintaining good oral health and brushing habits.

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Conflicts of Interest: Nil

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Ethical Clearance: It is taken from "Saveetha Institute Human Ethical Committee" (Ethical Approval Number- SDC/SIHEC/2020/DIASDATA/0619-0320)

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