Journal of Contemporary Issues in Business and Government Vol. 27, No. 2, 2021
https://cibg.org.au/

P-ISSN: 2204-1990; E-ISSN: 1323-6903
DOI: 10.47750/cibg.2021.27.02.065

Prevalence of Periodontal Diseases Among Individuals Above 45 Years: A Retrospective Study

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Abstract: Periodontal disease ranges from gingival inflammation to loss of teeth and supporting structures. The aim of this study was to assess the periodontal health among individuals above the age of 45 years. This retrospective study was conducted using the case sheets of the patients in a private institution between June 2019 to March 2020. A total of 242 patients were randomly recruited. Data regarding the patient's periodontal status were collected from the case records and analysed. Descriptive statistics and inferential statistics were done using SPSS software, Version 23. Among the 242 patients, 29 patients (11.96%) exhibited generalised chronic gingivitis, 32 patients (13.22%) exhibited clinically healthy gingiva and 181 patients (74.79%) exhibited generalised chronic periodontitis. Clinically healthy gingiva was highly prevalent(37.5%) among 45-54 year old patients. Generalised chronic periodontitis(27.1%) and generalised chronic gingivitis(31.0%) was highly prevalent among 65-74 year old patients. The association between age and periodontal status was statistically significant(p=0.016) Clinically healthy gingiva(75%), generalised chronic gingivitis(79.3%) and generalised chronic periodontitis(89.3%) were more prevalent among the males. The association between gender and the periodontal health was statistically not significant(p value=0.604).

Keywords: Clinically healthy gingiva; Gingivitis; Periodontitis.

INTRODUCTION

Since time beyond our reckoning, diseases of the oral cavity have been viewed separately from those of the rest of the body. Over the recent years efforts have been made to recognize oral health as an integral part of overall health. The oral cavity performs a multitude of functions with regard to daily life such as food intake, speech, social contact and appearance. Therefore, the quality of life is deterred when there is a compromise on oral health. (Jürgensen and Petersen, 2009). The World Health organisation defines periodontal health as a state free from inflammatory periodontal disease that allows an individual to function normally and avoid consequences due to current or past diseases. It is the chronic inflammatory disease of the periodontium and its advanced form is characterised by periodontal ligament loss and destruction of surrounding bone.(Pablo *et al.*, 2009) It is the main cause of tooth loss and is considered one of the two biggest threats to oral health.(Pablo *et al.*, 2009)(Benjamin, 2010) The hypothesis is that complex interactions between bacterial infection and host response is modified by various behavioural factors that can result in periodontal disease.(Ashby *et al.*, 2009) Periodontal disease is a complex infectious disease which results from the response of host and bacterial infection. It is modified by environmental, acquired risk factors and genetic susceptibility.(Marsh, 2006)

Chronic gingivitis is the most commonly seen among children and adolescents. They include plaque-induced chronic gingivitis (which is the most prevalent form), hormone-related gingivitis, drug-influenced gingival overgrowth and others.(Russell, 1971)The initial clinical changes seen in gingivitis include redness and swelling of the marginal gingiva and bleeding on probing. As the condition persists, tissues that were initially edematous may become more fibrotic. Probing depths may increase if significant hypertrophy or hyperplasia of the gingiva occurs, the probing depths may increase. A significant increase in subgingival levels of Actinomyces species, Capnocytophaga species, Leptotrichia species and Selenomonas species have been found in experimental gingivitis in children when compared with gingivitis in adults. These species may therefore be important in its etiology and pathogenesis.

Periodontitis is the most prevalent in adults, but can occur in children and adolescents. A study conducted in Brazil (2011) found that adolescents and young adults had a high prevalence of chronic periodontitis and that its presence was associated with age, socioeconomic status and calculus. Our study showed a 1.5% prevalence of chronic periodontitis, and this may be associated with the socioeconomic status of the students. The interpretation of the genotype status is not completely useful to alter the treatment regimen and the maintenance schedule.(Greenstein and Hart, 2002)Therefore, treatment outcome will still be heavily influenced by environmental and behavioral factors and whether an individual is genetically susceptible to disease or not.

Most of the periodontal diseases can be classified either as gingivitis or periodontitis, which occur due to the presence of bacterial plaque or calculus on the tooth surfaces (either supragingival or subgingival). It is generally accepted theory is that periodontal diseases begin as gingivitis, which progresses, only in some individuals, to periodontitis.(Carranza and Carranza, 1959) Many people in the world suffer from periodontal diseases. It is usually seen among the elderly people; however, some forms of periodontitis appear at a young age as well.

There has been a spike in the number of gingival and periodontal diseases in recent times. The health of the periodontal structures are of utmost importance; if a periodontal disease is left untreated it results in the destruction of the gingiva, cementum, periodontal ligament and the alveolar bone. Moreover, good oral health reflects the overall health of an individual. (Chauhan *et al.*, 2012)

Our department is passionate about research we have published numerous high quality articles in this domain over the past years ((Kavitha *et al.*, 2014) , (Praveen *et al.*, 2001),(Devi and Gnanavel, 2014), (Putchala *et al.*, 2013), (Vijayakumar *et al.*, 2010), (Lekha *et al.*, 2014a, 2014b) (Danda, 2010) (Danda, 2010) (Parthasarathy *et al.*, 2016) (Gopalakannan, Senthilvelan and Ranganathan, 2012), (Rajendran *et al.*, 2019), (Govindaraju, Neelakantan and Gutmann, 2017), (P. Neelakantan *et al.*, 2015), (PradeepKumar *et al.*, 2016), (Sajan *et al.*, 2011), (Lekha *et al.*, 2014a), (Neelakantan, Grotra and Sharma, 2013), (Patil *et al.*, 2017), (Jeevanandan and Govindaraju, 2018), (Abdul Wahab *et al.*, 2017), (Eapen, Baig and Avinash, 2017), (Menon *et al.*, 2018), (Wahab *et al.*, 2018), (Vishnu Prasad *et al.*, 2018), (Uthrakumar *et al.*, 2010), (Ashok, Ajith and Sivanesan, 2017), (Prasanna Neelakantan *et al.*, 2015)Over the past few years, our team has conducted numerous clinical studies (Panda *et al.*, 2014; Thamaraiselvan *et al.*, 2015; Varghese *et al.*, 2015; Khalid *et al.*, 2016; Ramesh, Sheeja Saji Varghese, *et al.*, 2016; Ramesh, Sheeja S. Varghese, *et al.*, 2016; Avinash, Malaippan and Dooraiswamy, 2017; Khalid, 2017; Priyanka *et al.*, 2017; Ramesh, Ravi and Kaarthikeyan, 2017; Ravi *et al.*, 2017; Gajendran, Parthasarathy and Tadepalli, 2018; Kavarthapu and Thamaraiselvan, 2018; Ramamurthy and Mg, 2018; Ramesh *et al.*, 2019) and systematic review (Mootha *et al.*, 2016) to analyse periodontal diseases. At present we are focussing on epidemiological studies. In this context, this study aims to assess the periodontal health among individuals above the age of 45 years.

MATERIALS AND METHODS

This retrospective study was conducted among patients above the age of 45 years who visited a private institution from June 2019 to March 2020. Prior permission to utilise the data for the and analysis was obtained from the Institution Ethics Board with the ethical approval number being: SDC/SIHEC/2020/DIASDATA/0619-0320. The study participants were divided based on the age as follows: 45-54 years,55-64 years,65-74 years, 75-84 years, 85-94 years and 95-104 years.

A total of 242 patients above the age of 45 years were randomly recruited. Consecutive sampling method was carried out. Cross verification of data was done via photographs, data evaluation was done with two reviewers and cross verified with third reviewer. Relevant data such as age and gender were recorded. Patients with systemic illness and those who were on long term medications were excluded from the study. Repeated and incomplete data records were excluded. Data was verified by an external reviewer. Data regarding the periodontal status of the patients were collected from the case records and analysed.

Data was retrieved and entered in Microsoft Excel sheet and later exported to SPSS software (version 23.0) for statistical analysis. Descriptive (frequency distribution and percentage) and inferential statistics (chi-square test) were done using SPSS software. Level of significance was set as $p<0.05$ for this study.

RESULTS AND DISCUSSION

A total of 242 patients above the age of 45 years were recruited and their periodontal status was assessed in the present study. Among the 242 patients, 29 patients (11.96%) exhibited generalised chronic gingivitis, 32 patients (13.22%) exhibited clinically healthy gingiva and 181 patients (74.79%) exhibited generalised chronic periodontitis [Figure 1].

The study participants were divided based on the age as follows: 45-54 years,55-64 years,65-74 years, 75-84 years, 85-94 years and 95-104 years. The periodontal status was assessed based on the age. Clinically healthy gingiva was highly prevalent(37.5%) among 45-54 year old patients. Generalised chronic periodontitis(27.1%) and generalised chronic gingivitis(31.0%) was highly prevalent among 65-74 year old patients. The association

between age and periodontal status of the older population was statistically significant (Chi-square analysis, p=0.016) [Figure 2].

Out of 242 patients, there were 196 males and 46 females. The periodontal health was assessed based on the gender. Clinically healthy gingiva(75%), generalised chronic gingivitis(79.3%) and generalised chronic periodontitis(89.3%) are more prevalent among the males. The association between age and the type of periodontitis was analysed using chi-square test and was statistically not significant with the p value of 0.604 [Figure 3].

The present study evaluated the periodontal health among individuals above the age of 45 years. A total of 242 patients were recruited. Out of which, 29 patients (11.96%) exhibited generalised chronic gingivitis, 32 patients (13.22%) exhibited clinically healthy gingiva and 181 patients (74.79%) exhibited generalised chronic periodontitis. A study by Eke et al(Eke *et al.*, 2016), among the states in the US stated that the highest prevalence of periodontitis was seen in New Mexico, Hawaii, and the District of Columbia each with a prevalence of higher than 70%. This finding is in accordance with our study.

In the present study, clinically healthy gingiva was highly prevalent(37.5%) among 45-54 year old patients. Generalised chronic periodontitis(27.1%) and generalised chronic gingivitis(31.0%) was highly prevalent among 65-74 year old patients. A study by Eke et al (Eke *et al.*, 2012)showed that periodontitis is highly prevalent among US adults ≥ 65 years of age, which is similar to the findings of our study. A study by Singh et al(Singh *et al.*, 2012) suggested that the periodontal treatment needs increased with advancing age. This is in accordance with our study.

In the present study, clinically healthy gingiva(75%), generalised chronic gingivitis(79.3%) and generalised chronic periodontitis(89.3%) are more prevalent among the males. The Government of India and World Health Organization collaborative program on oral health in India, 2007 stated that males were found to have higher scores of loss of attachment when compared to females(Shaju, Zade and Das, 2011). This is in agreement with the studies done by Doifode et al(Doifode, Ambadekar and Lanewar, 2000), Kundu et al(Kundu, Mehta and Rozra, 2011), and Sekhon et al(Sekhon, Grewal and Gambhir, 2015) which have concluded that periodontal disease was more common in males.

Our present study showed that generalised chronic periodontitis was more prevalent among individuals above the age of 45 years. However multicentered studies should be conducted among larger populations to confirm the study.

CONCLUSION

Within the limitations of the study, it can be concluded that there was higher prevalence of generalised chronic periodontitis (74.79%) than generalised chronic gingivitis(31.0%) among individuals above the age of 45 years. Also, the disease prevalence was more among males. There was a significant association between age and periodontal health among the study population.

Author's Contribution

Geethika.B performed the analysis, and interpretation and wrote the manuscript. Arvina Rajasekar contributed to conception, data design analysis, interpretation and critically revised the manuscript. Manjary Chaudhary participated in the study and revised the manuscript. All the authors have discussed the results and contributed to the final manuscript.

Conflict of Interest

None declared.

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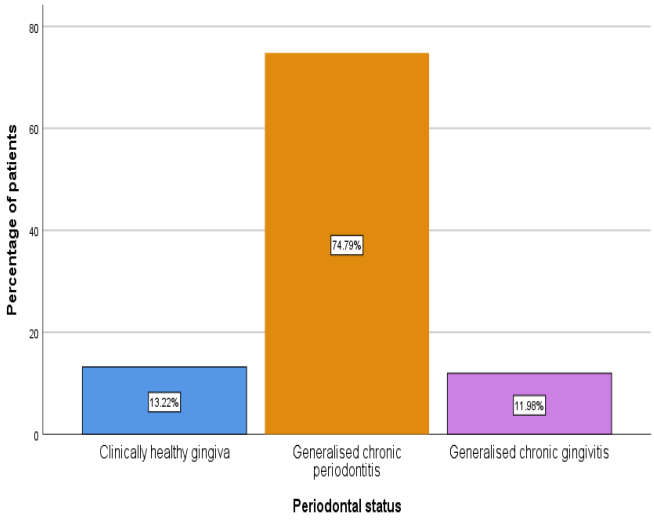

Fig.1: Bar graph depicting the prevalence of different periodontal diseases among the older population. X axis represents the periodontal status and Y axis represents the percentage of older patients. The most prevalent periodontal condition is generalised chronic periodontitis (orange) which constitutes to 74.79%, followed by clinically healthy gingiva (blue) which constitutes to 13.22% and generalised chronic gingivitis (purple) which constitutes to 11.96%.

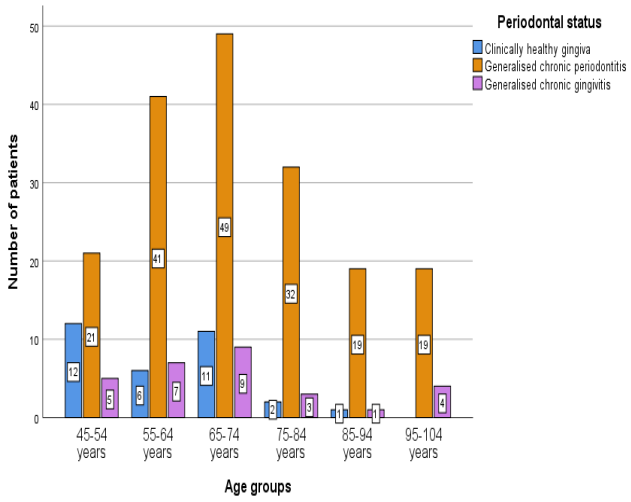

Fig.2: This bar graph shows association between different age groups and periodontal status among the older population. X axis represents the age groups and Y axis represents the number of patients. From this graph it can be inferred that generalised chronic periodontitis(49) and

generalised chronic gingivitis(9) was more prevalent among the 65-74 year old patients, clinically healthy gingiva(12) was more prevalent among the 45-54 year old patients. The association between age and periodontal status of the older population was statistically significant (Chi-square analysis; p=0.016)

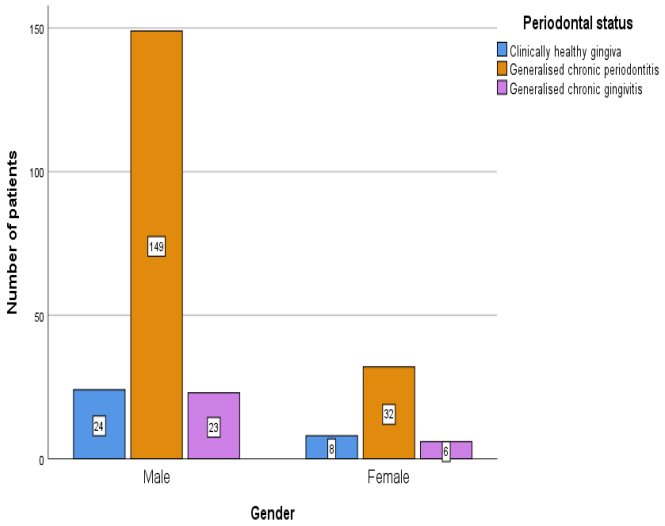

Fig.3: This bar graph shows association between gender and the periodontal status among the older population. X axis represents the gender of the patients and Y axis represents the number of patients. From this graph it can be inferred that clinically healthy gingiva , generalised chronic gingivitis and generalised chronic periodontitis were more prevalent among the males when compared to females. The association between gender and periodontal status was statistically not significant (Chi-square analysis, p=0.604).