

## Association between Age, Gender and Severity of Gingivitis among Children between 6-10 Years- A Retrospective Study

Research Article

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### Abstract

Children and adolescents are often affected by a variety of periodontal diseases and conditions. Gingivitis, if it occurs at an early age, tends to increase in its severity and finally peaks at the onset of puberty. However untreated gingival diseases in childhood, may progress to severe forms of periodontal diseases in adulthood. There have been many studies over the years which have analysed the character and factors affecting the distribution of carious lesions no similar measures have been implemented for gingivitis and periodontitis in pediatric dentistry. The aim of the present study was to evaluate the association between gender, age and gingivitis among children between 6-10 years of age visiting Saveetha Dental College. A retrospective study was carried out using digital records of patients who reported to the Department of Paediatric and Preventive Dentistry from June 2019 to March 2020. A total of 103 patients between ages of 6-10 years were finally included for the study evaluation. The age, gender and gingival status were observed from the digital records and tabulated on a spreadsheet. The collected data was analysed by computer software SPSS version 20 using Chi square test with the level of significance set at 5%. It was observed that around 46% of the participants had gingivitis. There was no significant association between gender and age and gingival status ( $p > 0.05$ ). Within limits of the study it can be concluded that there is high prevalence of gingivitis among pediatric patients, but there is no significant variation in gingival status by age and gender.

**Keywords:** Brushing Frequency; Gingivitis; Oral Hygiene; Periodontal Health.

### Introduction

Gingivitis is defined as a reversible inflammation of the gingiva [34]. Children and adolescents are often affected by a variety of periodontal diseases and conditions. Gingivitis especially is common around the time of puberty. Gingivitis, if it occurs at an early age, tends to increase in its severity and finally peaks at the onset of puberty. Thereafter the severity of gingivitis gradually decreases. If it persists, chronic periodontitis which is measured loss of attachment or recession becomes dominant and may continue to increase in severity [31, 32]. There have been many studies over the years which have analysed the character and factors affecting the distribution of carious [49] lesions for preventive dental care [13], no similar measures have been implemented for gingivitis and periodontitis in pediatric dentistry. Previously several clinical

trials on treatment as well as preventive dental care for carious lesions as well as dental trauma [45] have been conducted by our team (Govindaraju, Jeevanandan and E. M. G. Subramanian, 2017a [14]; Govindaraju, Jeevanandan and E. Subramanian, 2017 [13]; Jeevanandan, 2017 [20]; Jeevanandan and Govindaraju, 2018 [21]; Nair et al., 2018 [33]; Panchal, Jeevanandan and Subramanian, 2019 [38]). Previous literature has revealed that while there was high prevalence of periodontal disease in children, the correlation of gingivitis incidence as well as severity with age was low. The relation between plaque accumulation and gingival inflammation in children was also found to be lower than that of adults [50]. However untreated gingival diseases in childhood, may progress to severe forms of periodontal diseases in adulthood [30] which emphasizes the diagnosis and treatment of gingivitis in early ages. Previously our team has a rich experience in working on

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various research projects across multiple disciplines. [1, 19, 16, 24, 25, 36, 37, 40, 43, 48, 54, 57]. Now the growing trend in this area motivated us to pursue this project. The purpose of the present study was to determine the prevalence and severity of children and evaluate if age and gender are factors which cause variation in gingivitis in children.

## Materials and Methods

### Study Design:

In this retrospective study, data from 86000 patients within Saveetha Dental College were collected from dental records. At data extraction, all information was anonymized and tabulated onto a spreadsheet. The study was commenced after approval from the Institutional Review Board. To fulfil the inclusion criteria, patients between the age group of 6-10 years should have been included in the study. Patients who were outside this age group or those with other systemic complications were excluded from the study.

### Subjects and Procedures:

Data were collected from June 2019 to March 2020 for 103 patients. The following data were retrieved from the dental records: patient age, gender, Gingival index score, Plaque index score and periodontal status. The records were examined for errors by photographic evaluation.

### Statistical Analysis

The statistical analysis was done using SPSS software version 20.0 (SPSS Inc., Chicago, IL, USA). Chi-square test was used to compare the gender wise and age wise gingival status of the patients. The significance level was set at 5% for the present study.

## Results

The present study included a total of 103 patients within 6-10 years of age with a mean age of 8 years. Chi-square test between the three groups with respect to gingival status showed an unequal distribution of participants. 40.8% of the participants presented with generalised chronic gingivitis, 5.8% presented with localized chronic gingivitis and 53% had clinically healthy gingiva [Figure 1]. On analysis, there was no statistically significant association noted between gender and gingivitis in pediatric patients >0.05 by Chi square test [Figure 2]. However higher prevalence of Generalised chronic gingivitis was seen in males [Figure 2]. Higher prevalence of Generalised chronic gingivitis was observed among 10 year olds, followed by 8 year olds [Figure 3] however the association between age and gingivitis in pediatric patients was not found to be statistically significant by Chi square test,  $p=0.20$  [Figure 3].

It has been established in previous studies that there are changes in healthy gingiva towards gingivitis in early childhood itself [18]. The severity of gingivitis has also been reported to increase with increase in age. This cannot be verified in the current study as only the prevalence and distribution was recorded. The greater prevalence of gingivitis among 10 year old children is consistent with findings of a study by Hugoson et al. This variation in incidence of gingivitis can be attributed to the changing dentition at this age [4, 26, 53]. Hormonal changes according to Ketabi et al, during the onset and period of puberty are also known to aggravate gingival response to local factors [23]. Presence of loose, partially exfoliated deciduous teeth could also cause some degree of gingivitis. No significant association however was found between age and incidence of gingivitis was found in our study.

Mild chronic gingivitis is the most common form of periodontal disease [5] observed in children [28]. Aside from dental plaque, systemic conditions, pathologies [35] and economic conditions may also influence gingival response [6]. The prevalence of gingivitis was found to be 73% among children between 6-11 year olds

Figure 1. Pie chart depicting Percentage distribution of gingivitis. Generalised chronic gingivitis (40.7%) (Blue) was more in children followed by localised chronic gingivitis ( 5.8%) (Green). 53.4 % of children had healthy gingiva (Red).

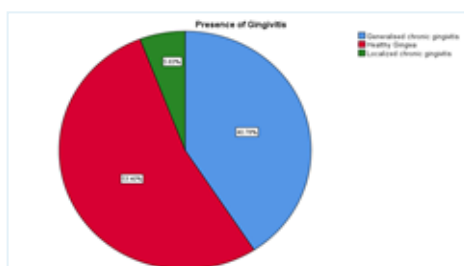
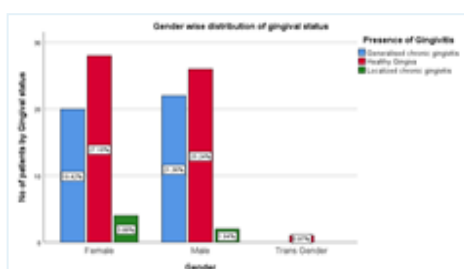
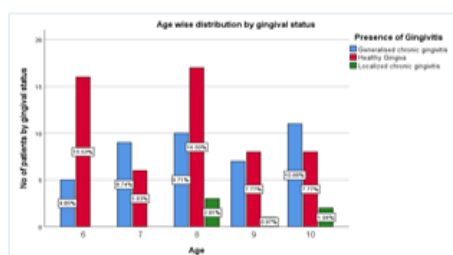


Figure 2. Bar graph depicting the association between the gender and gingival status. X axis denotes genders (Female, Male, Transgender) and Y axis denotes the number of patients by gingival status. Males have a higher prevalence of generalised chronic gingivitis (Blue) compared to other genders. Females have a higher prevalence of Localized chronic gingivitis (Green) compared to other genders. However, there was no statistically significant difference among the different genders (Chi-square P value = 0.793) ( $p>0.05$ ).



**Figure 3. Bar graph shows the association between gender and systemic disease. Bar graph X-Axis represents the various systemic diseases and the Y-Axis shows the number of patients who are involved in the study. Both the males and females had similar distribution of systemic illness with no statistically significant differences. (Pearson Chi square test;  $P=0.363, P>0.05$ ). It is shown that both the male and female patients are not affected with any systemic disease.**



in the study by Ketabi et al, while it was only 46% in the present study. This result may be due to the smaller sample size of the present study.

The prevalence of gingivitis was higher in males than in females in the present study; however this result was not statistically significant. This is in consensus with the results of a study by Kelly and Sanchez [22]. Whereas in a study by Gopinath et al, females had significantly greater incidence of gingivitis than in males [11]. A study by Marshal and Magnusson showed that this variation between gender could be more due to social differences [12, 17]; 'Fluoride, Fluoridated Toothpaste Efficacy And Its Safety In Children - Review', 2018), as opposed to any genetic predilection [27, 52]. The limitations of this study were that it was limited to the population of pediatric patients visiting Saveetha Dental College and was limited only to patients aged within 6-10 years. Certain factors which affect the results Hormonal changes, mixed dentition, partially exfoliated, loose deciduous teeth which could cause some degree of gingivitis. This study can be further taken forward with a larger study population in the future. The age group of children under the study can also be expanded for more conclusive results. Our institution is passionate about high quality evidence based research and has excelled in various fields [3, 8, 41-48, 51-57]. We hope this study adds to this rich legacy.

## Conclusion

Within the limits of this Study it can be concluded that, there is high prevalence of gingivitis among pediatric patients, however, there is no significant association between age, gender and severity of gingivitis.

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