

## **Prevalence of Class Ii Dental Caries in Children Treated Under General Anesthesia**

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### **ABSTRACT :**

**Introduction :** Dental caries is a chronic disease of the tooth which is represented by demineralisation and destruction of the organic matter of the tooth. Class II dental caries are found in the proximal surfaces of molars and premolars. In some uncooperative children, general anesthesia is used to treat the dental caries. Based on the severity of the class II dental

caries, treatment may vary from a simple restoration using composite or amalgam, root canal treatment or extraction. The aim of this study is to analyse the prevalence of class II dental in children treated under general anesthesia from a private dental hospital.

**Materials and method :** This study is a single centered retrospective study in which the data was collected from a private dental college and hospital in Chennai, India. Patient details were collected from the hospital management system and a total of 121 samples were collected. The data was tabulated using Excel and then statistically analysed using the latest version of SPSS software.

**Results and discussion :** 33.06% of the children treated under general anesthesia had class II dental caries. Children of 3 years of age had the highest incidence of class II dental caries treated under general anesthesia (10.74%) followed by 2 year olds (8.26%), and 4 year olds (6.61%).

**Conclusion :** Class II dental caries was seen in 33.06% of the children treated under general anesthesia and no significant association was found with increase in age.

**Key words :** Prevalence of dental caries, class II dental caries, general anesthesia, pediatric dentistry

## INTRODUCTION:

Dental caries, which is otherwise commonly called as tooth decay, is a widely prevalent chronic disorder of the tooth(1). Physical, biological, environmental and behavioural factors are the important risk factors for dental caries (2). Dental caries can be defined as the localised destruction of susceptible dental hard tissues by acidic by-products from bacterial fermentation of dietary carbohydrates. The first sign that represents the presence of dental caries are seen on the surface of hard tissues of the tooth(3). However the demineralisation process proceeds from within the bacterial biofilm which surrounds the surface of the tooth(4).

Dental caries are formed as a result of long term demineralisation of the primary and permanent tooth in both the crown as well as the root(5). Dental caries may be as simple as pit and fissure caries which can be treated with pit and fissure sealants or may involve enamel, dentin and pulp which requires restoration, deep caries management or root canal treatment accordingly(6). Bacteria like *Streptococcus mutans* and *Lactobacillus* present in the biofilm are largely responsible for the development of caries(7). They produce some weak acids as a result of fermentation of the carbohydrates. Demineralisation occurs when the acids produced cause a fall in pH value below the threshold value. As this continues, calcium, phosphate and carbonate diffuses and escapes out of the tooth eventually leading to cavitation(8). Cavitation can be avoided in the early stage of demineralisation by intake of calcium, phosphate and fluoride which allows remineralisation(9). Fluoride releasing cements like GIC are often used to prevent caries(10).

Assessing and recording of carious lesions is the key component in the assessing phase of the dental hygiene process of care(11). Thus Dr.G.V.Black classified the carious lesions based on the type and site of the lesion on the tooth. According to G.V.Black classification, class II dental caries can be defined as the cavity on the proximal surfaces of posterior teeth - premolars and molars(12). In order to categorize dental caries based on their severity, they are also classified as incipient lesions which reaches less than halfway to the enamel, moderate lesions that reach more than halfway through enamel without involving the dentino enamel junction, advanced lesion which reaches to or through the dentino enamel junction but not spreading more than halfway to the pulp and lastly severe lesions that enamel, dentin and more than half the distance to the pulp(13). Class II dental caries are cavitated lesions and hence diagnosis can be done through clinical examination with the help of an explorer and then the treatment plan can be decided after radiographic analysis(14). Based on the severity of the class II dental caries, treatment may vary from a simple restoration using composite or amalgam, root canal treatment or extraction(15). In children treating the same under chairside can be challenging and at times had to be treated only under General anesthesia.

General anesthesia is usually an aggregation of intravenous drugs and inhalational drugs that puts a patient in an induced sleep-like state(16). When a patient is under general anesthesia, pain is not felt as the person is unconscious(17). Dental

treatment under general anesthesia allows efficiently treating multiple teeth when there is less or no cooperation from the pediatric patients(18). Treatment under general anesthesia includes placing crowns, restoration and extraction. The aim of this study was to analyze the prevalence of class II dental caries in children treated under general anesthesia.

## **MATERIALS AND METHODS :**

This is a single centered retrospective study done under a hospital setting. The patient details were collected from the hospital management system from a private dental college and hospital in Chennai, India. Patient records between June 2019 and February 2021 were analysed. A total of 121 children who were treated under General anesthesia were included for data collection. The data was collected, tabulated and analysed using Excel sheet. These data were cross verified with photographs. Approval from the ethical committee was taken before beginning the study.

The collected data was later transferred and analysed using the latest version of SPSS software for statistical analysis. Frequency distribution was done to analyse the data. For chi square test, p value was set as 0.05 as level of significance.

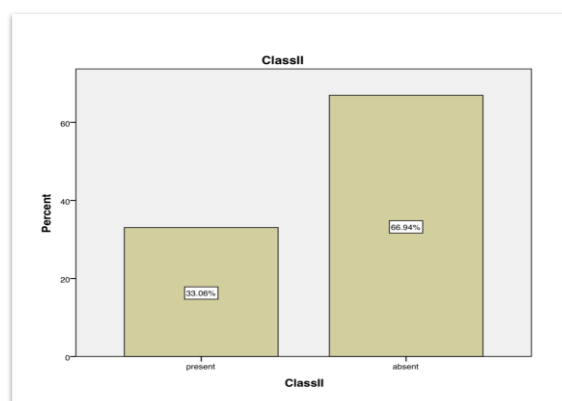
## **RESULTS :**

From the data collected, it was found that 48.80% of the total population were male children and 51.20% were female children. The average age of the children included in the study was  $3.50 \pm 1.766$  (Table 1).

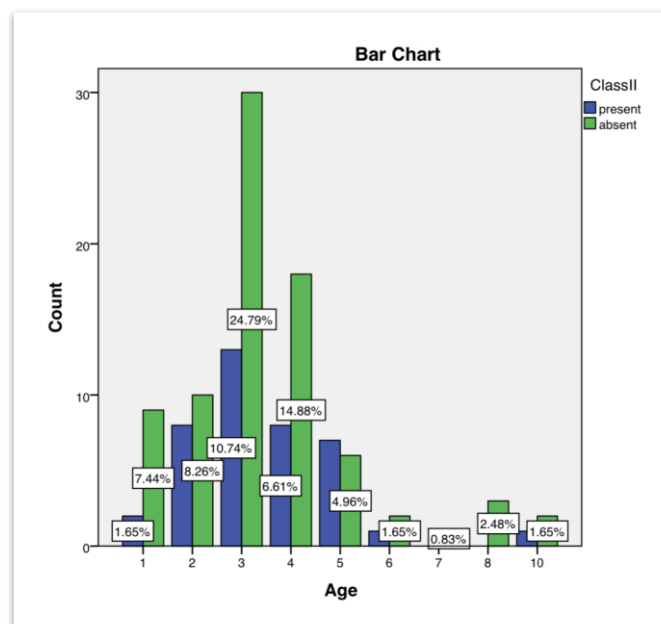
Age		3.50 ± 1.766
Sex	Male	48.80%
	Female	51.20%

**Table 1 : Demographic details**

Graph 1 represents the percentile distribution of class II dental caries in pediatric patients treated under general anesthesia. Out of the total 121 children who were treated under general anesthesia, 33.06% of the children had class II dental caries treated while 66.94% did not have class II dental caries. Graph 2 represents the percentile distribution of Correlation between age and class II dental caries. P value is 0.549 ( $>0.05$ ) which is statistically insignificant. It was found that children of 3 year olds had the highest incidence of class II dental caries treated under general anaesthesia (10.74%) followed by 2 year olds (8.26%), and 4 year olds (6.61%). It is observed that as the age of the children progresses, the incidence of dental caries has decreased due to a positive change in the oral hygiene measures that were followed by the older children.



**Graph 1 : Percentile distribution of Prevalence of class II dental caries**



**Graph 2 : Percentile distribution of Correlation between age and class II dental caries. P value is 0.549 (>0.05) which is statistically insignificant.**

## DISCUSSION :

This study investigates the prevalence of class II dental caries in children treated under general anaesthesia which helps in understanding the peak during which class II dental caries result and thereby creating awareness to take preventive measures at the right time.

In the present study it was seen that 33.06% of children treated under general anesthesia had class II Dental caries. The children belonging to the age group of 3 years had the highest incidence of class II dental caries, followed by children belonging to the age group of 2 years and 4 years. There was a rapid decline in the incidence of class II dental caries after the age of 5. This shows that as the age of the children increases, the children get accustomed to better oral hygiene measures and practices, thereby causing a decline in the incidence of dental caries or the carious lesions are treated at prompt time or there could be an increase in the severity of the dental caries. However no significant association was found between the incidence of class II dental caries and age.

In an article published by Lonim Dixit, et al., it was found that dental caries prevalence for 5 to 6 year old children was higher than children from other age groups(19). This is in contrast to the results from this study, which shows that prevalence of class II dental caries was more in 3 year old children. Another article by Bruce A, et al., highlights the prevalence of dental caries in primary teeth, by age, race and Hispanic origin among children aged 2 to 8 years in the United States between 2011 and 2012. 55.7% of children under the age group of 6 to 8 years of age had the most incidence of dental caries. The same article also shows the prevalence of dental caries in permanent teeth, by age, race and Hispanic origin among children aged 6 to 11 years in the United States between 2011 and 2012. 28.8% of the children under the age group of 9 to 11 years of age had the most incidence of dental caries(20).

An article by Marthaler TM, et al., reveals that at the age of 9 years, there is a decline in the rate of dental caries incidence among children recorded from several countries across the world(21). This is in agreement with our article which suggests decrease in the incidence of class II dental caries with increase in the age of the children. Another article that shows a similar response to our study is by Mahejabeen R, in which the children belonging among the age group of 3 to 5 had the highest incidence of dental caries in Sweden followed by 7 to 9 year olds(22).

In a study conducted by Kato H, among 3 year old Japanese children, the prevalence of dental caries was observed. The prevalence of dental caries in these children was found to be 14.7%(23). The prevalence of dental caries was cross related with the occupation of the parents. The prevalence result was almost close to the result from our study which was 10.74%. Bagramian RA's study states that in India, dental caries incidence is more in 12 year old children (53.8%)(24). The study also suggested many preventive dentistry programmes to address the crisis.

## **CONCLUSION :**

Class II dental caries was seen in 33.06% of the children treated under general anesthesia and no significant association was found with increase in age.

## **CONFLICT OF INTEREST :**

The authors declare that they have no conflict of interest for this study.

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