

Incidence of Class I vs. Class II dental caries in general population-A retrospective study.

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Abstract

Introduction: The prevalence of dental caries due to the continuous improvement of living conditions, improved self-care practices, effective use of fluorides, adoption of healthy lifestyles and implementation of preventive oral care programs while in developing countries increasing the level of dental caries and treatment need has been observed.

Materials and Methods: This study is a retrospective cross sectional study conducted in a Private Dental Institution, in Chennai to determine the class I vs. class II dental caries with the approval from the Institutional Review Board. It included demographic data of the patients along with dental status of each individual. The data collection was done by reviewing the patient's record and analysed the data of 86000 patients between June 2019 and March 2021.

Results: From our current study it is seen that, majority of the participants who had class I and Class II caries were between the age group of 31-45 years (29.9%) followed by 46-60 year (28.5%), 16-30 years (22%), >15 years (16.8%) and more than 60 years (2.5%). From our current study it is seen that, around 54.2% of the population had class I caries whereas 45.7% of the population had class II caries.

Conclusion: Within the limits of the current study it has been proven that, Class I caries are more prone to affect the general population than Class II caries.

Keywords: Dental caries, Class I caries, Class II caries, Poor oral hygiene, Innovative technology.

Introduction

The prevalence of dental caries due to the continuous improvement of living conditions, improved self-care practices, effective use of fluorides, adoption of healthy lifestyles and implementation of preventive oral care programs while in developing countries increasing the level of dental caries and treatment need has been observed [1].

Dental caries is the most common chronic disease worldwide. Dental caries is a multifactorial disease; several factors play a role in the initiation and progression of the lesion including environmental factors, host, and behavioural factors [1,2]. The distribution of caries has changed in the last century and exclusively recent data indicate that about 90 percent of carious lesions occur in the pits and fissures of permanent posterior teeth and that molar tooth are most susceptible to caries [3].

Class I caries include occlusal surface, buccal and lingual pits of posterior teeth and lingual surface of anterior teeth whereas Class II are involving proximal surface of posterior teeth [4]. In the recent years the global distribution of dental

caries presents a varied picture, most of the countries with low caries prevalence are experiencing an unprecedented increase in caries prevalence and severity of dental caries hence the present study was aimed at determining the prevalence of dental caries, effect of the gender and the positioning of the teeth and their surfaces in the oral cavity on the prevalence of dental caries [5].

When a cavity is prepared to remove a carious lesion it is typically slightly larger than the size of the lesion itself. On the tooth surface it has an outline form which refers to the perimeter of the cavity [6]. This is also usually a little larger than the perimeter of the carious lesion. The cavity must have subtle features incorporated in its form to ensure longevity of the restoration. These features are typically referred to as retention and resistance forms [7].

Retention forms represent features that enable a cavity to retain a restoration in place without movement. For example, if one was to think of a Class I cavity as resembling a box, when the base of the box (pupal floor) is slightly wider than its opening (occlusal) there is virtually no means for a restoration placed

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in such a cavity to get dislodged in one piece [6,8]. Resistance forms refer to the cavity design that prevents fracture of either the restoration or the tooth itself. For example, amalgam is a brittle material and if used in thicknesses less than 2 mm it may undergo fracture under loads of mastication [9,10]. Therefore, a cavity prepared for amalgam restoration must provide for adequate amalgam thickness on the occlusal of at least 2 mm [11]. Enamel is highly brittle, however, dentin which is softer acts as a cushion to support enamel and prevent its fracture. If an enamel margin was left unsupported during cavity preparation for amalgam, it may undergo fracture under forces of mastication [9]. Our team has extensive knowledge and research experience that has translate into high quality publications [12-32].

Hence, the aim of the study is to access the incidence of class I vs. Class II dental caries in general population.

Materials and Methods

This study is a retrospective cross sectional study conducted in a Private Dental Institution, in Chennai to determine the class I vs. class II dental caries with the approval from the Institutional Review Board.

Data collection

Data is extracted from Patient management software of Saveetha dental college from the time period February 2020 to February 2021 based on the following inclusion and exclusion criteria's.

Inclusion criteria

Patients who had Class I and Class II caries

Exclusion criteria

- Patients below the age of 18 years.
- Retreatment cases.
- Teeth with pulpal involvement.

Data Analysis

The data collected were reviewed and cross verified. The collected data is entered in MS Excel sheet, and transferred to SPSS version 21 for analysis. Independent variables were PID, Name; Dependent variables were age, gender, tooth number, apical preparation size. Chi square test was used to analyse the association. *P value* less than 0.05 was considered statistically significant. Results were presented in the form of bar diagrams.

Results

The results of the study are presented as bar diagrams below. Figure 1 represents the frequency distribution of age group. Figure 2 represents the frequency distribution of gender. Figure 3 represents the frequency distribution of type of caries. Figure 4 represents the frequency distribution of quadrant number. Figure 5 represents the association of type of caries and age. Figure 6 represents the association between the type of caries and gender.

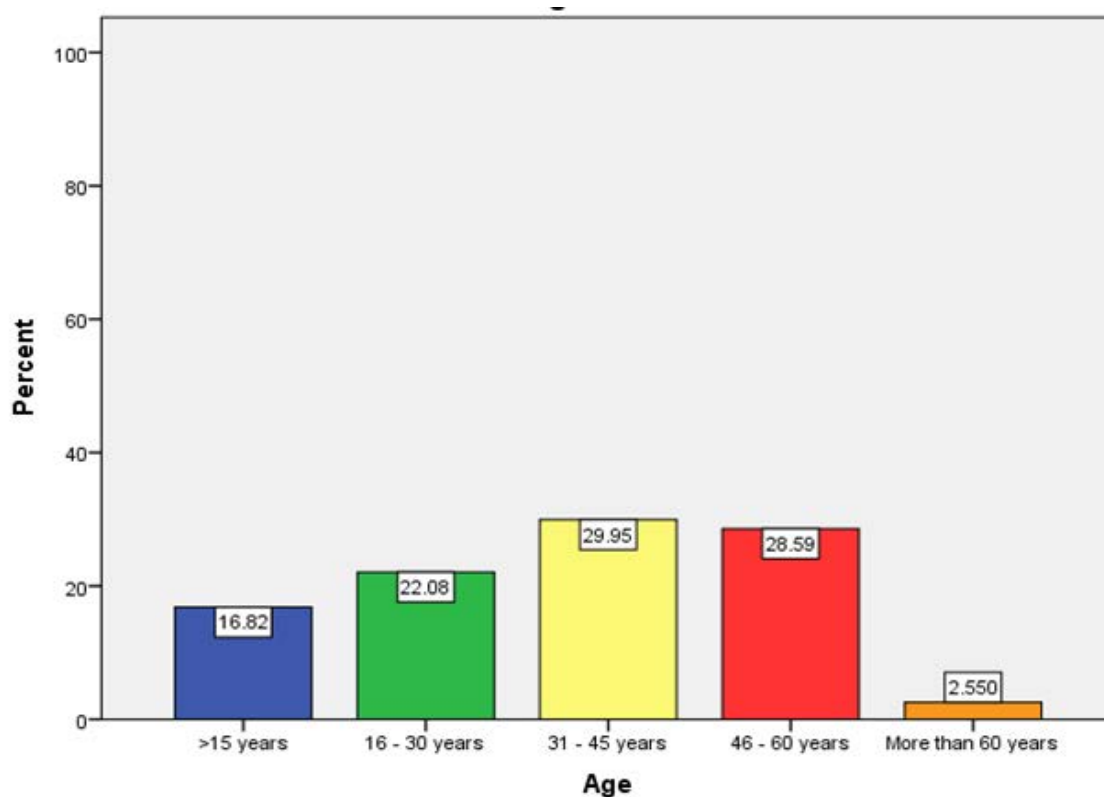


Figure 1. This bar chart represents the frequency distribution of age group. X axis represents the age group and Y axis represents the percentage of patients with class I and class II caries. Majority of the patients were between the age group of 31-45 years (Yellow) 29.95 compared to 46-60 years (Red) 28.5%.

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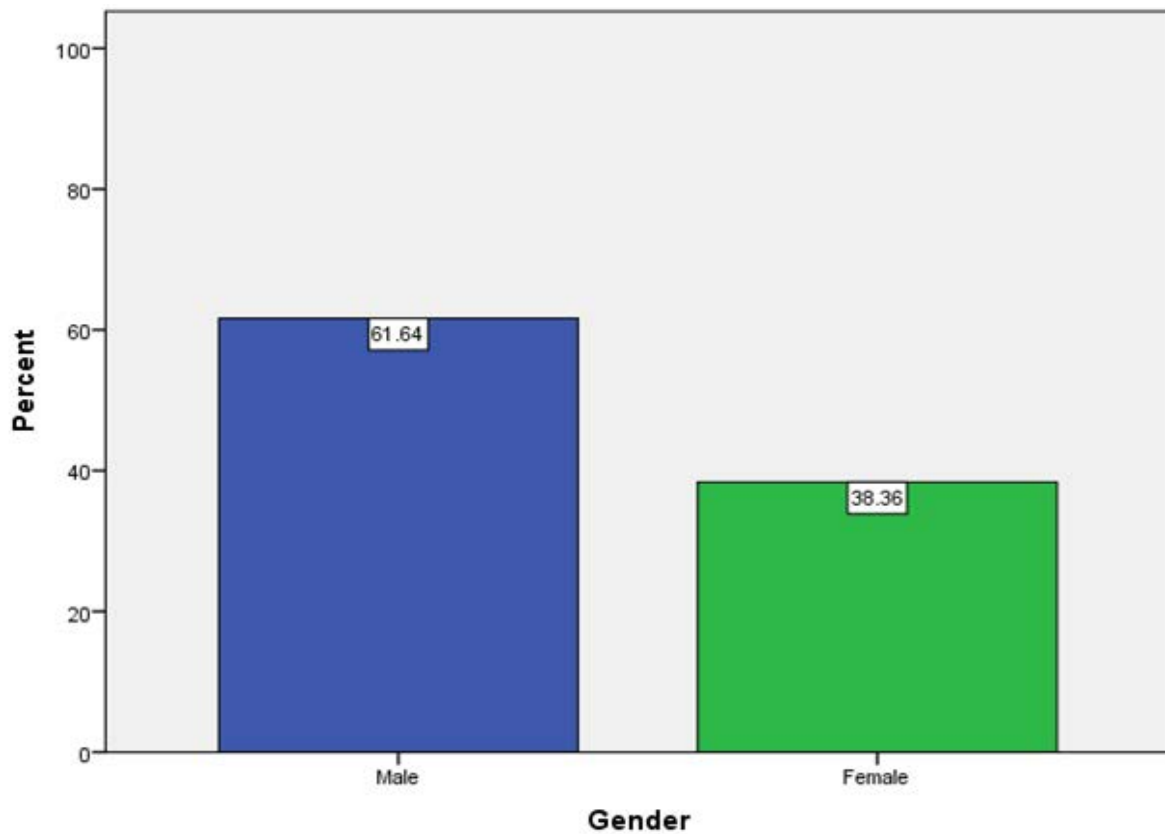


Figure 2. This bar chart represents the frequency distribution of gender. X axis represents gender and Y axis represents the percentage of patients with class I and class II caries. Majority of the patients were males (Blue) 61.6% compared to females (Green) 38.3%.

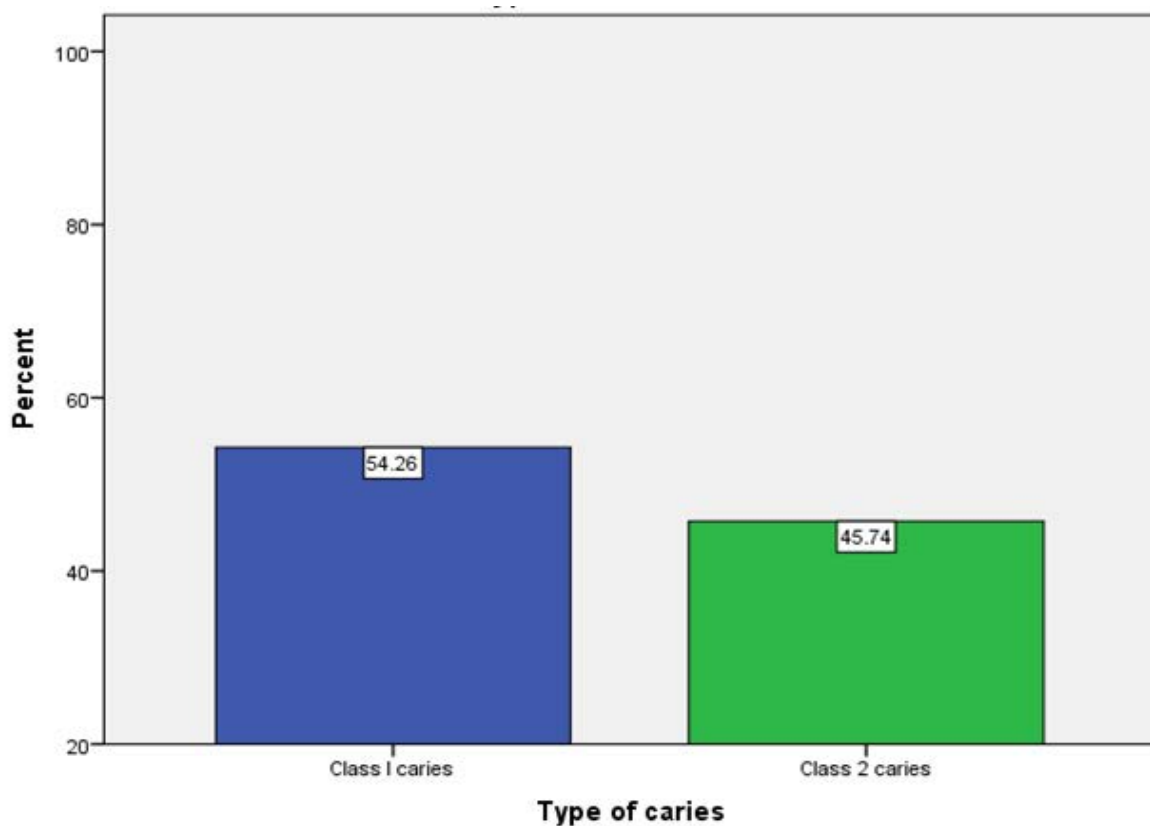


Figure 3. This bar chart represents the frequency distribution of type of caries. X axis represents type of caries and Y axis represents the percentage of patients with class I and class II caries. Majority of the patients had class I caries (Blue) 54.2% compared to class II caries (Green) 45.7%.

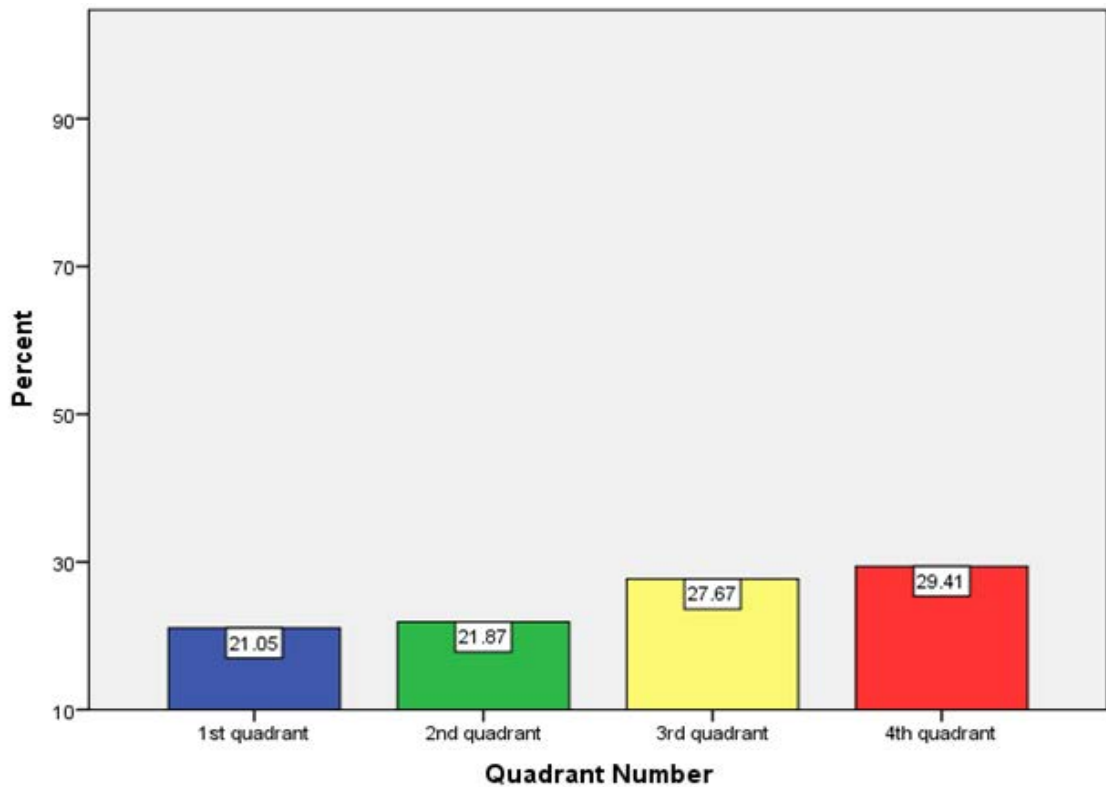


Figure 4. This bar chart represents the frequency distribution of quadrant number. X axis represents the quadrant number and Y axis represents the percentage of patients with class I and class II caries. Majority of the patients had caries in relation to fourth quadrant (Red) 29.4% when comparing with 3rd quadrant (Yellow) 27.6%.

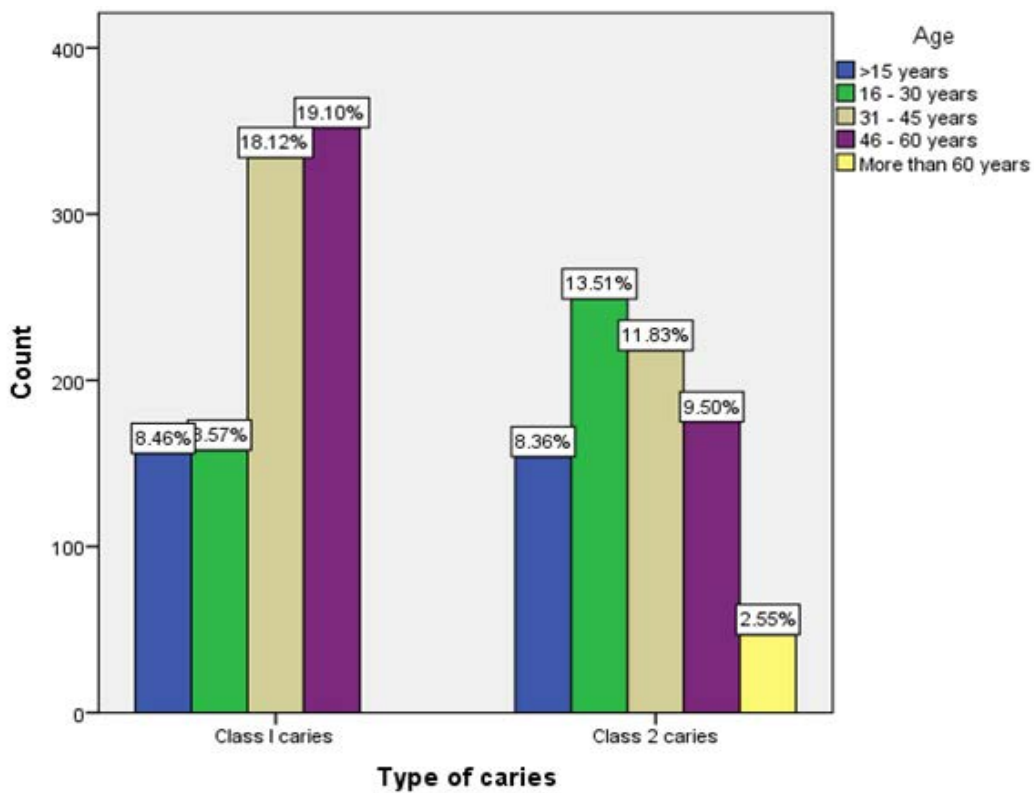


Figure 5. This bar chart represents the association of type of caries and age. X axis represents the type of caries and Y axis represents the age. Majority of the patients between age group of 46-60 years have experienced Class I caries. Chi square analysis was done and P value was found to be $0.01 < 0.05$, which is statistically significant.

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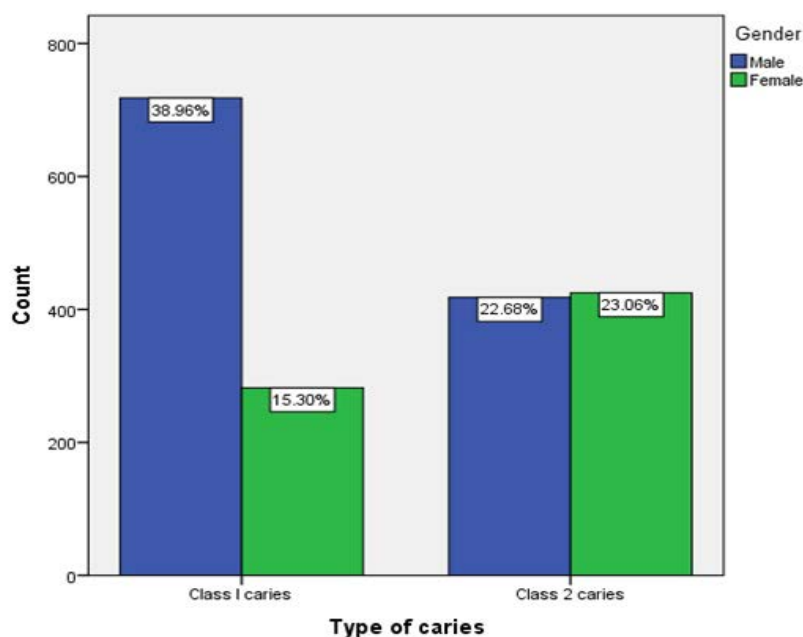


Figure 6. This bar chart represents the association between the type of caries and gender. X axis represents the type of caries and Y axis represents the gender. Majority of the male patients have experienced Class I (38.9%) whereas female patients have got Class II caries (23%). Chi square analysis was done and P value was found to be $0.00 < 0.05$, which is statistically significant.

Discussion

From our current study it is seen that, majority of the participants who had class I and Class II caries were between the age group of 31-45 years (29.9%) followed by 46-60 year (28.5%), 16-30 years (22%), >15 years (16.8%) and more than 60 years (2.5%) which correlates with the study done by Celia et al., 201632. With increasing age, the prevalence of caries in primary teeth decreased and the prevalence of caries in permanent teeth increased. The highest caries restoration rate was observed in the 12-year-old age group for primary teeth and in the 25-35 year old age group for permanent teeth [33]. Tooth decay is prevalent among middle-aged and older adults. While tooth decay is related to preventable causes such as sugar consumption, fluoride usage, and access to dental care, disparities exist even when dental care is available, due in part to social determinants of health [34].

The findings from the current study proves that, around 61.6% of the male population are prone to more dental caries than female population (38.36%) which correlates with the study done by Shaffer et al. [35]. Sex differences in dental caries experience have also been widely observed, with most studies showing that women and girls are at higher risk and experience more carious lesions than do men and boys [36]. The factors that cause men to experience a greater burden of dental caries are not fully understood, and some of these factors may differ among populations. Possible explanations have been proposed, including earlier tooth eruption in males (and therefore increased time of exposure to cariogenic processes), differences in dietary behaviors, access and utilization of oral health care, hormonal and/or physiological differences, and characteristics of the dentition, tooth enamel, or saliva [36,37].

From our current study it is seen that, around 54.2% of the population had class I caries whereas 45.7% of the population

had class II caries which correlated with the study done by Zubair et al. [38]. Class I caries include occlusal surface, buccal and lingual pits of posterior teeth and lingual surface of anterior teeth whereas Class II are involving proximal surface of posterior teeth [39]. As the food particles are more prone to damage the occlusal surfaces more than proximal surface, Class I caries are said to be more common among the general population [40]. Association between type of caries and age was done and P value was found to be $0.01 < 0.05$, which is statistically significant.

From our current study it is seen that, majority of the caries have affected the 4th quadrant (29.4%) more than other quadrants. Association between the type of caries and gender was done and P value was found to be $0.00 < 0.05$, which is statistically significant.

Conclusion

Within the limits of the current study it proven that, Class I caries are more prone to affect the general population than Class II caries. Dental caries prognosis depends on the health of the patient, maintenance of oral hygiene, and the extent and severity of dental caries. If the individual reports early signs of dental caries, a lesion may be reversed with a preventive method and minor dental intervention like remineralization of the initial lesion. If dental caries progresses to the moderate stage with loss of specific tooth structure, the tooth must be filled and rebuilt. Prognosis is also crucial for decision-making regarding whether ordinary restoration or extensive restorative treatment should take place. Extensive restoration should not occur when there is a chance that the prognosis will be poor for salvaging the tooth.

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Conflict of interest

Nil

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