Original Research Article

PREVALENCE OF DENTAL CARIES IN PERMANENT SECOND MOLARS IN TEENAGERS USING ICDAS

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. Dental caries are versatile, capable of affecting the crown portion of the tooth initially, and may affect the unprotected root surfaces later on. International Caries Detection and Assessment System (ICDAS) provides a systematic approach of reviewing the available clinical dental caries to evaluate the development of dental caries

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 1804 samples were collected. The data was tabulated using Excel and then statistically analysed using the latest version of SPSS software.

Results and discussion : The prevalence of ICDAS score 3 in second molars is higher in 17 year old patients with 2.88% in maxillary right second molars, 3.33% in maxillary left second molars, 3.55% in mandibular left second molars and 3.71% in mandibular right second molars. The prevalence of dental caries in permanent second molar is 9.34%. It is seen that ICDAS score 3 is 8.71% prevalent followed by ICDAS score 5 which is 0.63%.

Conclusion : Within the limitations of the study, it was found that the prevalence of dental caries in permanent second molars is 9.34% with ICDAS score 3 being the most prevalent followed by ICDAS score 5 which is 0.63%.

Keywords : Dental caries, ICDAS classification, innovative criteria

INTRODUCTION :

Dental caries, also commonly referred to as tooth decay, is a prevalent chronic disorder of the tooth(1). Risk factors for tooth decay include physical, biological, environmental and lifestyle related elements. These risk factors lead to stepwise demineralisation and remineralisation of the hard tissues present in the teeth(2). Dental caries can be present throughout the lifetime, in both deciduous and secondary dentition(3). Dental caries result as an outcome of interaction between microbes that produce acid, fermentable sugars and other host elements like saliva and environment of the oral cavity(4). Dental caries affects the crown portion of the tooth initially, and may affect the unprotected root surfaces later on(5). The equity between microbial and defensive factors impact and determine the start, development and advancement of the dental

caries(6). 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 restoration or root canal treatment accordingly(7).

Assessing and recording of carious lesions is the key component in the assessing phase of the dental hygiene process of care(8). Measuring dental caries is necessary for conducting epidemiological studies among population groups, for public health programme arrangement and assessment, and to test prevention and control procedures(9). The ICDAS system serves as a fair measuring unit for dental caries(10). International Caries Detection and Assessment System (ICDAS) provides a systematic approach of reviewing the available clinical dental caries to evaluate the development of dental caries(11). ICDAS score 0 represents sound tooth structure, score 1 represents the first noticeable visual change in the enamel, score 2 represents the marked visual change in the enamel, score 3 represents the localised enamel break down involving no visible dentin, score 4 represents the underlying dark shadow from the dentin which may or may not involve enamel breakdown, score 5 represents distinct cavity with visible dentin and score 6 represents extensive distinct cavity with visible dentin(12). Prevalence of dental caries is computed with taking factors like percent of people impacted, number of tooth affected, number of teeth surfaces involved and extent, magnitude and severity of the carious lesion(13).

Dental caries being an irregularly distributed disease, is preventable and treatable, in which economic status, nutrients and lifestyle habits play a major role(14). To achieve primary prevention of dental caries, the focus should be targeted on factors like acid producing bacteria, insufficient saliva flow, deficient exposure to fluoride, poor economic status, imbalance in diet and improper maintenance of oral hygiene(15). Secondary prevention approach and management should focus on managing the development of dental caries by using comparatively less intrusive and conservative treatment for the patients(16) . Many studies show that everyday use of fluoride toothpaste has proven a key factor in reducing the dental caries all over the world in recent years(17). Our team has extensive knowledge and research experience that has translate into high quality publications(18–30) (31–37). The aim of this study is to evaluate the prevalence of dental caries in permanent second molars in teenagers using ICDAS.

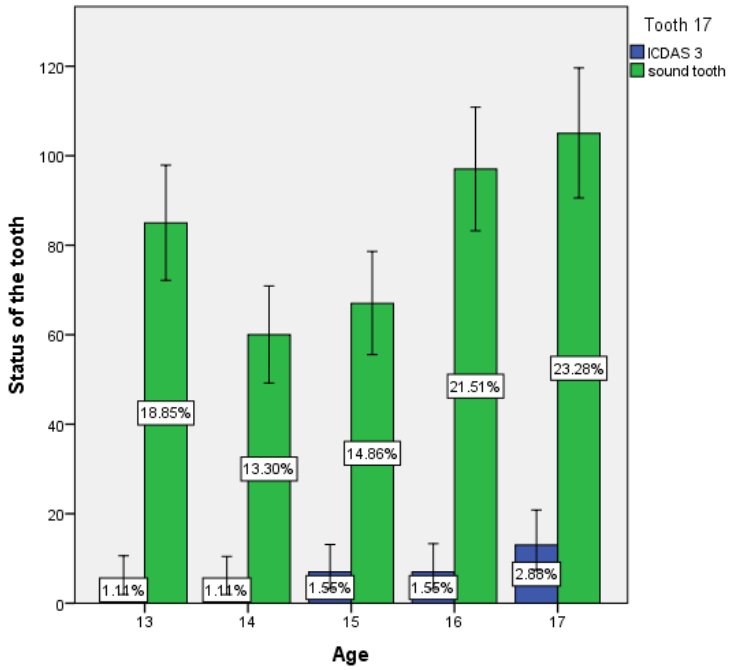
MATERIALS AND METHODS :

This was a single centered retrospective study done in a university 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 1804 teenagers who visited the hospital for dental treatment were included for data collection. The inclusion criteria included children within the age group of 13 to 17. Children from other age groups and problems other than dental caries were excluded. 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.

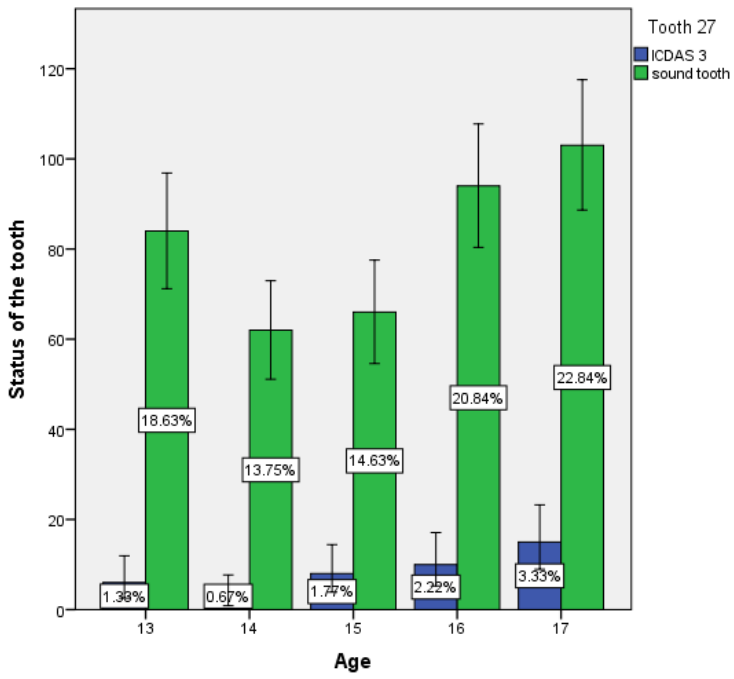
RESULTS :

From the data collected in this study, it is seen that ICDAS score 3 is more prevalently seen in 17 year old patients. ICDAS score 3 is 8.71% prevalent which is followed by ICDAS score 5 which is 0.63% prevalent. ICDAS score 1,2, and 4 are not seen in these samples. Graph 1 represents the percentile distribution of correlation between the age of the patients and status of maxillary right second molar wherein X axis represents the age of the patients participating and Y axis represents the count of the teeth. Blue colour denotes that the tooth is scored 3 in the ICDAS system and green colour denotes that the status of the tooth is sound. Prevalence of dental caries with ICDAS score 3 is most prevalent in 17 year old patients (2.88%) followed by 16 year old patients (1.55%) when observed in maxillary right second molar. The p value of the correlation graph is found to be 0.635 (>0.05) which is statistically insignificant.



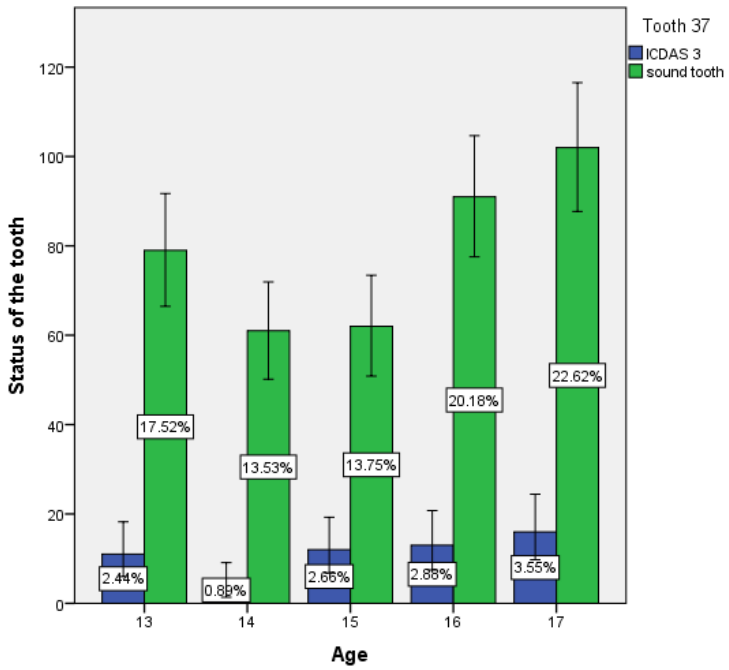
Graph 1 : Percentile distribution of correlation between age of the patients and status of maxillary right second molar. The p value is 0.635 (>0.05) which is statistically insignificant.

Graph 2 represents the percentile distribution of correlation between the age of the patients and status of maxillary left second molar wherein X axis represents the age of the patients participating and Y axis represents the count of the teeth. Blue colour denotes that the tooth is scored 3 in the ICDAS system and green colour denotes that the status of the tooth is sound. Prevalence of dental caries with ICDAS score 3 is most prevalent in 17 year old patients (3.33%) followed by 16 year old patients (2.22%) when observed in maxillary left second molar. The p value of the correlation graph is found to be 0.371 (>0.05) which is statistically insignificant.



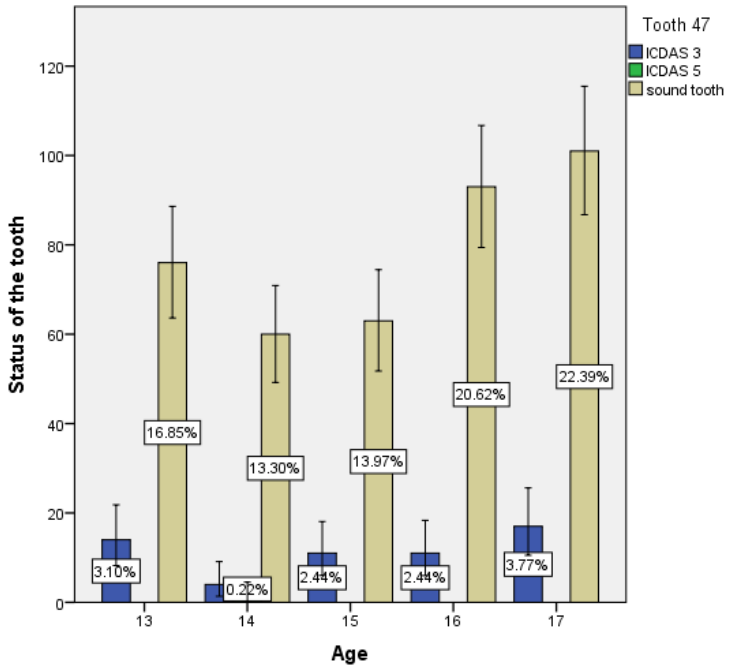
Graph 2 : Percentile distribution of correlation between age of the patients and status of maxillary left second molar. The p value is 0.371 (>0.05) which is statistically insignificant.

Graph 3 represents the percentile distribution of correlation between the age of the patients participating and the status of mandibular left second molar wherein X axis represents the age of the patients participating and Y axis represents the count of the teeth. Blue colour denotes that the tooth is scored 3 in the ICDAS system and green colour denotes that the status of the tooth is sound. Prevalence of dental caries with ICDAS score 3 is most prevalent in 17 year old patients (3.55%) followed by 16 year old patients (2.88%) when observed in mandibular left second molar. The p value of the correlation graph is found to be 0.482 (>0.05) which is statistically insignificant.



Graph 3 : Percentile distribution of correlation between age of the patients and status of mandibular left second molar. The p value is 0.482 (>0.05) which is statistically insignificant.

Graph 4 represents the percentile distribution of correlation between the age of the patients participating and the status of mandibular right second molar wherein X axis represents the age of the patients participating and Y axis represents the count of the teeth. Blue colour denotes that the tooth is scored 3 in the ICDAS system, green colour denotes that the tooth is scored 5 in the ICDAS system and beige colour denotes that the status of the tooth is sound. Prevalence of dental caries with ICDAS score 3 is most prevalent in 17 year old patients (3.77%) followed by 13 year old patients (3.10%) when observed in mandibular right second molar. The p value of the correlation graph is found to be 0.262 (>0.05) which is statistically insignificant. The prevalence of dental caries in permanent second molar is 9.34%. It is seen that ICDAS score 3 is 8.71% prevalent followed by ICDAS score 5 which is 0.63%.



Graph 4 : Percentile distribution of correlation between age of the patients and status of mandibular right second molar. The p value is 0.262 (>0.05) which is statistically insignificant.

DISCUSSION :

The risk of getting tooth decay varies with the location of the tooth. Posterior teeth like molars and premolars have higher probability for developing dental caries(38). Presence of increased number of grooves, pit and fissures and multiple roots contributes to easier development of dental caries in posterior teeth(39). It is found in our study that the prevalence of ICDAS score 3 in second molars is higher in 17 year old patients with 2.88% in maxillary right second molars, 3.33% in maxillary left second molars, 3.55% in mandibular left second molars and 3.71% in mandibular right second molars. The prevalence of dental caries in permanent second molar is 9.34%. It is seen that ICDAS score 3 is 8.71% prevalent followed by ICDAS score 5 which is 0.63%. There is a gradual increase in the incidence of dental caries with ICDAS score 3 with age in the teenagers.

In an article by Alm A, et al., approximal caries prevalence was recorded in various age groups. The article concluded that the prevalence of dental caries in teenagers was more common in 15 year old patients (40). This is in contradiction with the findings from our study which showed that prevalence of dental caries in second molars were more in 17 year old patients. Alshahrani, et al., in 2018 collected clinical data of dental status from 20 male teenagers and analysed the prevalence of dental caries (41). Prevalence of dental caries in the population was found to be 72.9% with maximum prevalence in the posterior teeth. This is in accordance with our study which shows 9.34% of dental caries prevalence in the second molars.

Migle, et al., studied the prevalence and severity of dental caries in teenagers in Lithuanian countries(42). 18 year olds had had the most prevalence of dental caries in that cross sectional study. This is in slight accordance with our study wherein the prevalence of dental caries was more in 17 year old patients. Skinner J, et al., studied the correlation between increased intake of sugary drinks and prevalence of dental caries in teenagers in Australia(43). The study showed that 16 years old were more prone to dental caries which goes hand in hand with our study where 17 year olds were more prevalent for developing dental caries in second molars.

CONCLUSION : Within the limitations of the study, it was found that the prevalence of dental caries in permanent second molars is 9.34% with ICDAS score 3 being the most prevalent followed by ICDAS score 5 which is 0.63%. 17 year olds were the most affected teenagers. Preventive measures like using fluoride toothpaste, maintaining good oral hygiene, having balanced nutritious diet and limiting sugary drinks will go a long way to prevent dental caries.

ETHICAL CLEARANCE : Taken from Saveetha Institute Human Ethical Committee.

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