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RESEARCH ARTICLE

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Prevalence of proximal caries in the posterior teeth in patients visiting a dental college

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ABSTRACT

Dental caries is a multifactorial disease, with many risk factors contributing to their initiation and progression. The study was aimed to find the incidence of proximal caries in posterior teeth in the patients visiting a dental hospital. Data was collected retrospectively from the records of the private dental hospital. The population included in the study were the patients who reported with proximal caries in the posterior teeth. Descriptive statistics, Cross tabulation and chi square test were done. Out of 846 patients 392 had disto occlusal caries, 375 had mesio occlusal caries and 79 had mesio occluso distal caries. Within the limit of the study, it was evident that the disto-occlusal caries were the most common type of class II caries and class II caries were more common in females between the age group 25-35 in the first quadrant.

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KEYWORDS

Class II caries, dental caries, disto occlusal caries, mesio occlusal, mesio occlusal distal, prevalence

INTRODUCTION

Dental caries is the most common chronic dental disease worldwide and affects approximately 90% of the population. [1] Class II caries involve the proximal surfaces; the mesial and the distal surfaces of the posterior teeth with or without access established from the occlusal surface. If the caries involve the mesial and the occlusal surfaces it is referred to as mesio-occlusal caries [MO]. If the caries involve the distal and the occlusal surfaces it is referred to as disto-occlusal caries [DO]. If the caries involve the mesial, occlusal and distal surfaces, it is referred to as Mesio-occlusal-distal caries [MOD]. Published reports revealed a wide diversity in the prevalence of different classes of dental caries among adults and geriatric populations, this was attributed to environmental and host factors[2]

Dental caries is an infectious disease characterized by a multifactorial etiology and slow evolution that leads to the destruction of dental hard tissues. The implementation of preventive measures, the need of investing in education for the correct maintenance measures of oral health, associated with preventive and continuous medical and dental care are the key to the awareness which can also aid in the decline of the prevalence of dental caries. [3] The distribution of caries has changed in the last century and exclusively recent data indicate that above 90% of carious lesions occur in the pits and

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fissures of permanent posterior teeth and also the molar teeth are most susceptible to caries. [4]
Previously our team had conducted numerous clinical trials [5] [6] [7] [8] [8,9] [10] [10,11]and lab studies [12] [13] [14] [15] and in-vitro studies [16] [17] [18] [19]over the past 5 years. Now we are focussing on epidemiological surveys.
Background knowledge on dental caries including prevalence, extension and severity provides a baseline data for the eminence essence of caries prevention which pose a greater burden as it financially and negatively affects the quality of an individual. [20] To provide the most beneficial treatment factored to a given level of current risk and probable future risk, dentists must be able to assess the following : 1) presence and severity of all carious lesions 2) tooth surface cavitation status 3) caries risk and 4) outcome probabilities for treatment regimen.[21]Individual tooth surfaces have vastly different susceptibilities to caries, with the pit and fissure surfaces being the most susceptible and the proximal surfaces being the least susceptible. [22][23] Various reasons for the differing caries susceptibility are different tooth surface morphology or different post eruptive enamel maturation of the surfaces. [24][25] The caries susceptibility of a tooth surface also varies over time. [26].It was found that susceptibility of a tooth surface to caries is low during the first post eruptive fear, but rises rapidly to the maximum rate approximately two to three years post eruption. [27].
Previously our team had conducted numerous clinical trials and in vitro studies[28–47][28–47] over the past 5 years. Now we are focusing on prevalence studies
The present study was aimed at determining the prevalence of proximal caries in the posterior teeth.

MATERIALS AND METHOD

Study Setting

The present study was conducted to evaluate the prevalence of proximal caries in the posterior teeth in the patients reporting to a dental hospital. The pros of the study included the available data and similar ethnicity and the cons being geographical limitations. Ethical clearance for this study was obtained from the institutional ethical committee. (SDC/SIHEC/2020/DIASDATA/0619-0320) The study included 846 patients who have visited the dental college and been diagnosed with class II dental caries aged above 18 years. Informed consent was obtained from the patients who participated in the study. Two examiners were involved in the study.

Sampling

It is a retrospective study. The data was collected from the patient records between June 1, 2019 to March 31, 2020. Around 80,000 case sheets were reviewed, out of which, 846 met the inclusion criteria. The inclusion criteria were patients above 18 years of age, patients with class II caries and exclusion criteria were patients under 18 years of age, patients without class II caries. Simple random sampling, collecting more data sources and including the data only from the institute were the measures taken to minimize the bias.

Data Collection and analysis

The data collection was done from patient records and the results were tabulated. The incomplete or censored data were verified and excluded from the study. The data were entered and analysed using IBM SPSS software version 20.0. Descriptive statistics [ex: frequency and percentages] were calculated to explore and general features of the data. A cross tabulation analysis was conducted to examine the categorical variables. Independent variables were age and gender and dependent variables were class II caries and incidence. Chi-square test was used to identify significant differences between the different variables.

RESULTS AND DISCUSSION

Table 1 and Graph 1 shows the prevalence of type of class II caries. It was found that 46.3% were distoocclusal caries, 44.3%- mesioocclusal caries, 9.3%-mesioocclusodistal caries.
Table 2 and Graph 2 show the correlation of age and type of class II dental caries . In the age group 25-35, 185 patients had distoocclusal caries, 162 patients had mesioocclusal caries and 38 patients had mesioocclusodistal caries, total 385. In the age group 36-45, 146 had distoocclusal caries, 145 had mesioocclusal caries and 31 had mesioocclusodistal, total 322. In the age group 46-55, 68 had mesioocclusal caries, 28 had distoocclusal caries and 10 had mesioocclusodistal caries, with the total of 139 patients The p-value was 0.652 greater than 0.05 which shows that there was no significant difference between age and class II dental caries.
Table 3 and Graph 3 showed the correlation between quadrant and type of class II caries. In the 1st quadrant there were 144-distoocclusal caries, 126- mesioocclusal caries and 21-mesioocclusodistal caries. In the 2nd quadrant there were 90-distoocclusal caries, 82-mesioocclusal caries and 34-mesioocclusodistal caries. In the 3rd quadrant there were 15-distoocclusal caries, 72- mesioocclusal caries and 7-mesioocclusodistal caries. In the 4th quadrant 83-distoocclusal caries, 95- mesioocclusal caries and 71-mesioocclusodistal caries. The $p<0.05$ which shows there was a significant association between quadrant and type of class II caries.

In this study we have observed that out of 846 patients it was found that 392 patients had distoocclusal caries , 375 patients had mesioocclusal caries and 70 patients had mesioocclusodistal caries.

According to Talabani et al [48], the most common type of the class II caries were distoocclusal caries which was similar to our study. In that study it was also found that class I dental caries are the most common dental caries among all the other classes of caries.It was found that the prevalence of caries was more in female patients. According to Santi et al [49] a higher rate of caries was among the female patients. There is an impact of hormonal fluctuation and pregnancy on the nature of the saliva which has an effect on the oral ecology thus there is a change in the physical mechanism.[50] This has direct and significant influence on poorer dental health in women than in men. In a study conducted by Saveanu et al, they have stated that the female had less prevalence of caries and this was because of the fact that the females were more concerned about their dental health and also had frequent dental checkups compared to the males. [51] It was found the class II caries were most common in the maxillary posteriors. According to Talabani et al (13) the common measure of caries is DMFS index. The reason for dental caries common in maxillary arch is because there is more access of dental aids to the mandibular arch compared to the maxillary arch.

It was found that the class II caries were more common in the late 20's and early 40's age group. Sonbul H et al [50] stated that the prevalence of caries were common in the age group 40-50 because of the contact points, poor oral hygiene habits and also because of their negligence in dental care. Because of the dietary habits as well as a more cariogenic diet and easier access to refined sugars and sugar products, the individuals in their early 20's are greatly affected. The study conducted by Sonbu H et al [50]also stated that one surface restoration was more common than the two surface restoration which means class I dental caries were more common than the class II dental caries.

There are also other factors which are associated with the dental caries such as impaired brushing techniques, insufficient knowledge about the dental aids, biochemical differences in salivary buffering, diet, deleterious habits, different proportions of salivary components, and possible differences in chemical composition of the saliva.

The limitations of the study included the difference in socioeconomic status, small sample size and different quadrants were included in the study. The future scope of this study acknowledges the risk factors, education about regular dental check ups, early diagnosis and prompt treatment and future studies can be conducted in a larger population with different geographical populations.

CONCLUSION

Within the limit of the study, it was evident that the disto-occlusal caries were the most common type of class II caries and class II caries were more common in females between the age group 25-35 in the first quadrant.

AUTHORS CONTRIBUTIONS

First author (R. Keerthana) performed the analysis, and interpretation and wrote the manuscript. Second author (Dr. Iffat Nasim) contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Third author (Dr.Manjari Chaudhary) participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

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CONFLICT OF INTEREST

No conflict of interest.

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ETHICAL CLEARANCE

It is taken from "Saveetha Institute Human Ethical Committee" (Ethical Approval Number-SDC/SIHEC/2020/DIASDATA/0619-0320)

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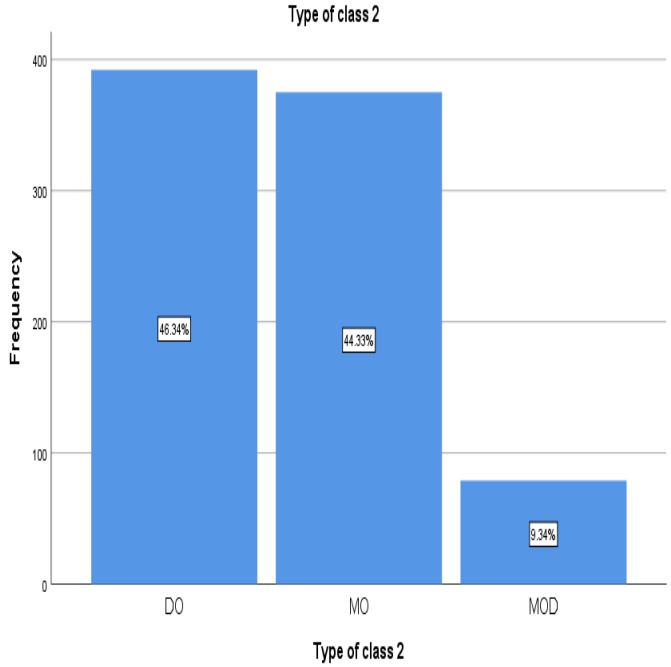
Table 1: This table shows the frequency and percentage of patients diagnosed with different types of class II Dental caries.

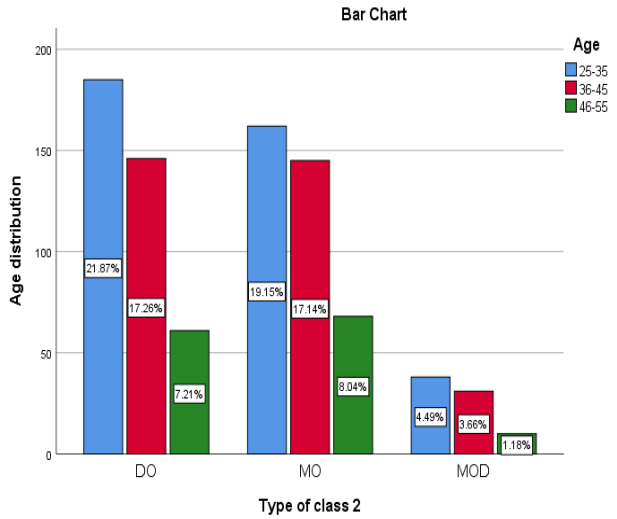
Type of class 2					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	DO	392	46.3	46.3	46.3
	MO	375	44.3	44.3	90.7
	MOD	79	9.3	9.3	100.0
	Total	846	100.0	100.0	



Graph 1: This Bar chart shows the frequency of the patients with different types of class II dental caries. Blue bar shows the type of class II dental caries. X axis shows the different types of class II dental caries and Y axis shows the frequency of patients diagnosed with each type of class II dental caries. It is found that distoocclusal (DO)caries was the most common type of class II dental caries (46.3%)

Table 2: This table shows the age of the patients diagnosed with types of class II dental caries. DO- Distoocclusal caries, MO- Mesiooclusal caries, MOD- Mesioocclusodistal caries

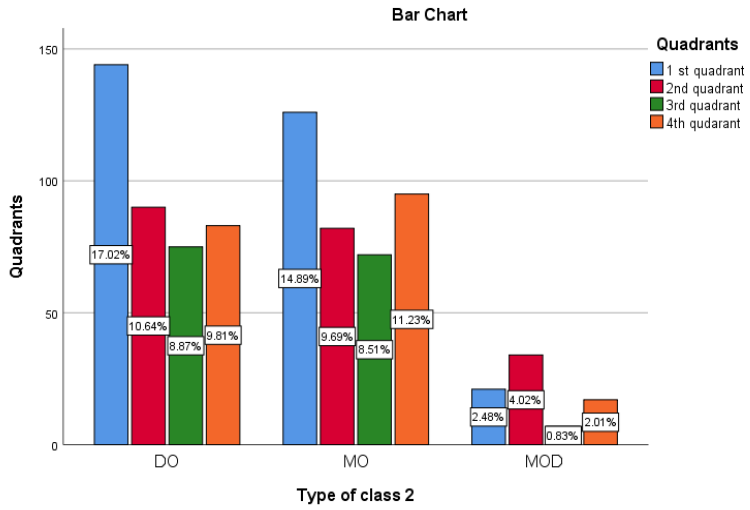
		Type of class 2			
		DO	MO	MOD	Total
Age	25-35	185	162	38	385
	36-45	146	145	31	322
	46-55	61	68	10	139
Total		392	375	79	846



Graph 2: This Bar chart shows the association between age of the patients and the type of class II dental caries. X axis denotes the type of class II dental caries and the Y axis denotes the age groups. Distoocclusal caries(21.8%), mesioocclusal caries (19%) and mesiodistoocclusal caries (4.4%) were more common in the age group 25-35. There was no significant difference between age and the type of class II dental caries. (Chi square test, p value=0.652) p>0.05

Table 3: This table shows the quadrant wise distribution for the types of class II dental caries.

TeethNo * Type of class 2 Crosstabulation					
		Type of class 2			
		DO	MO	MOD	Total
Teeth No	1 st quadrant	144	126	21	291
	2nd quadrant	90	82	34	206
	3rd quadrant	75	72	7	154
	4th quadrant	83	95	17	195
Total		392	375	79	846



Graph 3: This bar chart shows the association of the quadrants and the types of class II dental caries. X axis denotes the different types of class II and Y axis denotes the quadrant in which class II dental caries were present. Distoocclusal (17%) and mesioocclusal (14.8%) caries were more common in the 1st quadrant , mesioocclusodistal caries was more common in the 2nd quadrant(4%). The 1st quadrant had more number of class II caries. A significant difference was found between quadrant and the type of class II dental caries. (Chi square test, p value=0.002) p<0.05