Original Article

CLASS III DENTAL CARIES AND NEED FOR ROOT CANAL TREATMENT IN MAXILLARY ANTERIORS - A HOSPITAL BASED RETROSPECTIVE ANALYSIS

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Abstract

The aim of this study is to assess the number of RCT done in the maxillary anteriors among patients with Class III caries . The study includes patients visiting the OP of Saveetha Dental College diagnosed with class III caries on the maxillary anteriors and to find the number of RCTs done among those patients. The results were statistically analysed using SPSS software. Descriptive statistics and chi-square tests were done for gender and diagnosis of the tooth. Among a total of 345 patients diagnosed with class III caries on the maxillary anteriors, 21.74% have undergone RCT while 78.26% of the patients did not undergo RCT. The incidence of RCT done in patients with Class III caries was found to be low. This might be due to the aesthetic consideration of the patients and hence early treatment.

KEYWORDS: Irreversible pulpitis, RCT, class III caries, maxillary anteriors.

DOI: 10.47750/pnr.2022.13.S06.063

INTRODUCTION:

Dental caries is one of the most common preventable diseases, people are susceptible to the disease throughout their lifetime.(Pitts, 2004)(Fejerskoy and Kidd, 2003)(Pitts, 2004) It can be arrested and can be reversed in its early stages,but is often not self limiting and without proper care, caries can progress until the tooth is lost.((Sciences and US Department of Health and Human Services; National Institutes of Health; National Institute on General Medical Sciences, 2000)-(Kidd, Giedrys-Leeper and Simons, 2000))

Dental caries is the localised destruction of susceptible dental hard tissues by acidic by-products from bacterial fermentation of carbohydrates.(Fejerskoy and Kidd, 2003)(Marsh and Martin, 1992)(Fejerskoy and Kidd, 2003) The decayed surface is the sequela of the disease process and is a sign of advanced disease.(Kidd, Thylstrup and Fejerskov, 1981) The signs of the carious demineralisation are seen on the hard dental tissues, but the disease process is initiated within the bacterial biofilm that covers a tooth surface. Moreover, the very early changes in the enamel are not detected with traditional clinical and radiographic methods. Dental caries is a multifactorial disease, several factors play a role in the initiation and progression of the lesion including, environmental, host and behavioral factors.(Marsh and Martin, 1992; Shaffer *et al.*, 2013)

To know how early in the caries process the pulp may be involved is important for the pathogenesis of dental caries and treatment. So far no systemic examination has been made of the response of the pulp in early caries. The effect of dental caries on the pulp, impairment of odontoblasts and inflammation of the pulp were observed only under very deep active lesions in the dentin. No observations of pulpal response under enamel caries alone was made.(Brännström and Lind, 1965)

Root canal therapy (RCT) and tooth extraction have been conventional treatment options for management of human mature teeth with irreversible pulpitis.(Asgary *et al.*, 2013) Root canal treatment is a common procedure in dentistry. The main indications for RCT are irreversible pulpitis and necrosis of dental pulp due to caries or dental trauma.(R, Rajakeerthi and Ms, 2019)

Now the growing trend in this area motivated us to pursue this project.Various aspects of endodontics and conservative dentistry over the past five years. Now we are focusing on retrospective studies, the idea for which has stemmed from the current interest in our community.Our team has extensive knowledge and research experience that has translate into high quality publications(Sathivel *et al.*, 2008; Panda *et al.*, 2014; Govindaraju, Neelakantan and Gutmann, 2017; Johnson *et al.*, 2020; Saraswathi *et al.*, 2020) (Kumar *et al.*, 2006; Devi and Gnanavel, 2014; Varghese *et al.*, 2015; Sivamurthy and Sundari, 2016; Chen *et al.*, 2019). This study aims in finding the prevalence of class III caries among maxillary anteriors and the incidence of those anteriors with an infected pulp that underwent root canal therapy.

MATERIALS AND METHODS :

Study population:

A retrospective study was carried out among 345 patients who visited University in Chennai diagnosed with class III caries on the maxillary anteriors. Among these, the prevalence of root canal treatment done was assessed. The data was collected from patients records between June 2019-March 2020. The data contains details of patients, intraoral photographs and treatment being done.

Inclusion criteria:

- Patients with class III caries without pulpal involvement
- Patients with class III caries who underwent RCT
- Maxillary anteriors

Exclusion criteria:

- Patients with periradicular disease
- Pulp necrosis

Sample size: Sample size[N=345] is the total number of patients who visit University in Chennai with class III caries. Their distribution according to gender and diagnosis were recorded.

Ethical approval: Ethical clearance was obtained from the Institutional Ethical Committee and Scientific Review Board [SRB] of University in Chennai.

Data analysis:The data collected were entered in an Excel sheet and subjected to statistical analysis using SPSS software. Descriptive statistics was done i.e frequency and cross tabulation. A chi square test was done between gender and diagnosis of the tooth. Independent variables are gender while dependent variables are diagnosis of the tooth. The level of significance was $p<0.05$.

RESULTS AND DISCUSSION:

It was found that male distribution was predominant with 65.80% of cases whereas females were only about 34.20% [Figure 1]. The prevalence of class III caries in maxillary anteriors without pulpal involvement was found to be 78.26%, whereas maxillary anteriors with class III caries that had pulpal involvement and had undergone RCT was only 21.74% of the cases [Figure 2]. Figure 3 shows the association between gender and diagnosis among the population. It was found that Class III caries in maxillary anteriors that have not undergone RCT was highly prevalent among males (55.36%) than females (22.90%), whereas Class III caries in maxillary anteriors that have undergone RCT was found to be higher in females (11.30%) than males (10.43%). chi-square test shows high significance (p value = 0.000).

The present study was conducted to evaluate the prevalence of maxillary anteriors with class III caries with pulp involvement among both genders .The results of this study shows that there was a higher percentage of class III caries without pulp involvement [78.26%] and lower incidence of RCT performed due to class III caries [21.74%] in maxillary anteriors. There is no previous literature that shows the association between class III caries and Root canal therapy.However,the prevalence of class III caries have been studied . A study by Mustang Demirci et al, shows that the prevalence of proximal caries in incisors,canines,premolars and occlusal fissures in molars was the highest in both sexes.(Demirci, Tuncer and Yuceokur, 2010) A study by Talabani RM et al, shows that 331 [4.1 %]of patients had class III menial caries and 289 [3.6%] of patients had class III distal caries.(Talabani, Al-Zahawi and Ibrahim, 2015) A similar study done in Nepal state that the prevalence of class III caries among 18.75 %. (Bhagat and Shrestha, 2014)

The limitation of this study is that it is done among a limited population and geographic location. The future scope of the study is to conduct the study among a larger population and to consider the prognosis.Our institution is passionate about high quality evidence based research and has excelled in various fields (Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019;

Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Mathew *et al.*, 2020). We hope this study adds to this rich legacy.

Figures

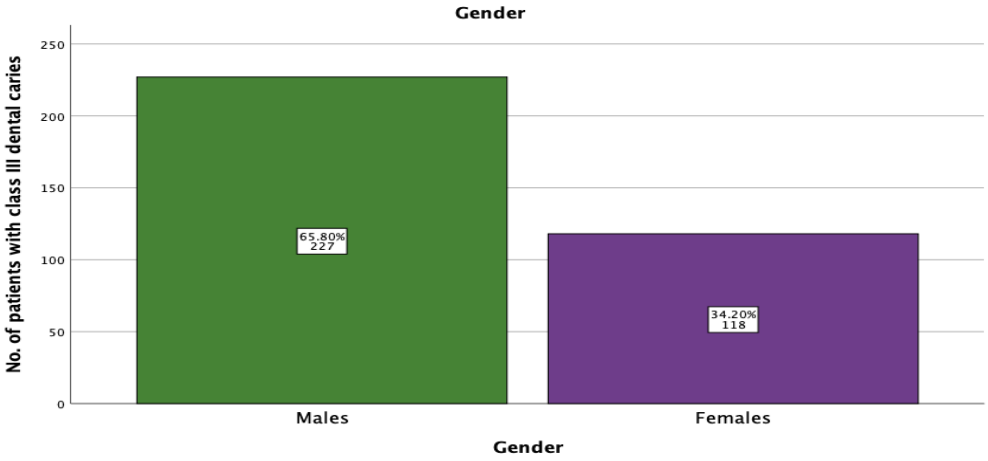

Figure 1: Shows the gender distribution among the study population. X axis corresponds to the gender and Y axis corresponds to the number of patients with class III dental caries. Male (green) distribution was higher when compared to females (purple) with a percentage of 65.80% and 34.20% respectively.

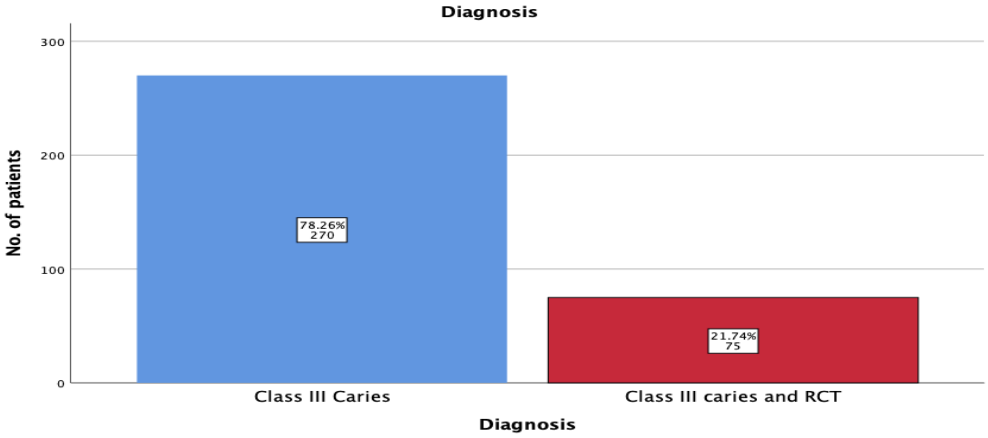

Figure 2: Bar chart shows the comparison between number of patients with normal class III dental caries and number of patients with Class III dental caries that had undergone RCT. X axis corresponds to diagnosis of patients with class III caries and Y axis corresponds to the number of patients. Number of patients with class III caries which have not undergone RCT (blue) were higher with a percentage of 78.26% when compared to the number of patients with class III caries which have undergone RCT (red) with a percentage of 21.74%.

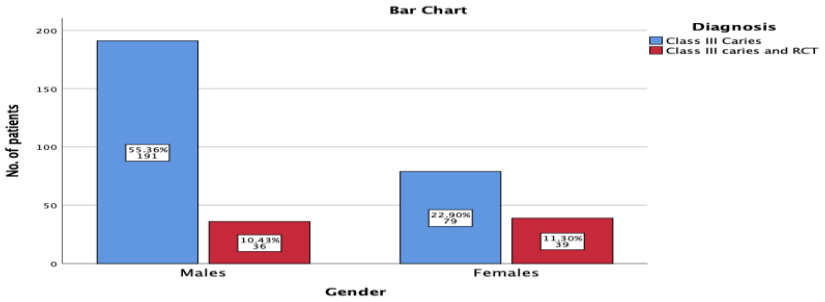

Figure 3: Bar chart shows the association between gender and diagnosis. X axis corresponds to the gender and Y axis corresponds to the number of patients. Number of patients with class III caries that had not undergone RCT (blue) was more in males (55.36%) when compared to females (22.90%), whereas number of patients with class III caries that had undergone RCT (red) was found to be higher in females (11.30%) when compared to males (10.43%). The difference was statistically significant (chi-square value - 13.488, p value - 0.000 (< 0.05).

CONCLUSION :

The current study shows highest prevalence of maxillary anteriors with class III caries without pulp involvement and that underwent Root canal therapy. This may be because patients might consider treatment of class III caries in maxillary anteriors in the earlier stages as the aesthetics is compromised . Among the patients with class III caries who had undergone RCT, females were found to be significantly higher than males.

AUTHOR CONTRIBUTIONS: All authors have equal contributions in bringing out this research work.

ACKNOWLEDGEMENT: This study was supported by Saveetha Dental College and Hospitals,Chennai.

CONFLICT OF INTEREST: Nil.

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