
Prevalence of Pulpectomy In Mandibular First Primary Molar with Occlusal Caries

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Abstract: The aim of this present study was to evaluate the pulpectomy procedure in mandibular first primary molars with occlusal caries in the Chennai population visiting the Outpatient Department of Saveetha Dental College and Hospital, Chennai based on their gender and age. A total of 199 patients details aged between 4 and 11 years old obtained from patients records to assess pulpectomy treatment done with occlusal caries involved, with their gender and age. Data analysis was done with the Statistical Package for Social Sciences (SPSS) for Windows (version 20). Chi-square test was used to determine the association of occurrence pulpectomy with occlusal caries involvement in a mandibular first primary molar, gender, and age. In this present study, the prevalence of male patients was 55.78% and for females was 44.22% Males patients more prevalent for pulpectomy due to occlusal caries. Patients in the age group between 4 to 5 years old have a higher prevalence (54.77%). The most prominent teeth number affected by occlusal caries was right mandibular first primary molar-84, with 52.76% prevalence. Association between the tooth number and age of the patient. P-value=0.917, (P>0.05), association between the tooth number and the gender of the patients, P-value=0.942, (P>0.05), both of which are statistically not significant. There is no significant association between gender, age and the tooth number that was treated with pulpectomy. Within this limit of this study, this study showed that the prevalence of pulpectomy in mandibular first primary molars due to occlusal caries was more in males than females, and higher incidence for age between 4 and 5 years old, with the most affected tooth was on the right side

Keywords: Occlusal caries ; Mandibular first primary molar; Prevalence; Pulpectomy

INTRODUCTION

Deciduous teeth are an important chewing organ during childhood, playing a crucial role in the normal eruption of permanent teeth, normal jaw development and general health of children. The pulp exposure of deciduous teeth caused by dental caries or trauma and secondary inflammation affect local occlusal development, and even systemic physical or mental health. Therefore, it is critical to protect deciduous teeth and to improve the treatment of deciduous pulp. Currently, the prevalence of dental caries in children is as high as 50%-60%. Impaction pain and deep caries with largely damaged dental crown are commonly found upon first visit. Despite advances in the prevention of dental caries in paediatric dentistry, the appearance of primary teeth with pulp involvement and premature loss continues to be a frequent problem. Pulpectomy of primary teeth with irreversibly inflamed or necrotic pulp is a treatment with a variable prognosis that allows the correct eruption of the successor and maintenance of the space [(Udall, 2009)].

Pulpectomy is a conservative treatment approach to preventing the premature loss of primary teeth that can result in loss of arch length, insufficient space for erupting permanent teeth, impaction of premolars, and mesial tipping of molar teeth adjacent to the lost primary molar. Pulpectomy of primary molar teeth is considered as a reasonable treatment to ensure either normal shedding or a long term survival instance of retention [(Koshy and Love, 2004)] despite being more conservative treatment option than extraction. Pulpectomy is a root canal procedure for pulp tissue that is irreversibly infected or necrotic. The root canals are debrided and shaped and canals are dried and obturated with a resorbable material. The main objective of pulpectomy in the primary intention is to obtain every primary teeth as fully functional component for proper mastication, phonation, swallowing, prevention of detrimental physiologic effect due to tooth loss [(Bakland,

2010)]. Maintaining the deciduous teeth in function until their natural exfoliation is absolutely necessary. Pulpectomy is mainly applied to the teeth without necrosis in the root canal, such as various types of pulpitis and accidental pulp exposure, and the highest clinical success rate can reach up to 98%. However, due to drug characteristics and the infection degree of teeth, postoperative complications such as pulpitis, periapical inflammation and internal root canal absorption often occur. Vital pulp therapy is a way of saving deciduous teeth. Aseptic root canal preparation and hermetic seal of the root canal system determine the success of pulpectomy procedure in necrotic primary teeth. These treatment ensures the resorption of primary root and filling material to permit normal eruption of succedaneous tooth [(Winters, Cameron and Widmer, 2013)]

Few indications of pulp therapy include pulpitis, pulpal necrosis. The primary objective of pulp treatment is to maintain the integrity and health of the oral tissues. [(Rocha *et al.*, 2008)] A high success rate of pulpectomy in primary teeth has led pediatric dentists to prefer pulpectomy over extraction and space maintainer. Although a tooth can remain functional without a pulp, it is desirable to attempt to maintain the vitality of the pulp. The failure and success of the pulpectomy depends upon the proper instrumentation and the obturation techniques. [(Gardner, 1950)] These pulpectomy also has drawbacks such as difficulty in negotiating, cleaning and shaping and filling the bizarre and tortuous root canals. [(Robinson and W-Y. Chan, 2009)] Para1. Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J *et al.*, 2018; Menon *et al.*, 2018; Prabakar *et al.*, 2018; Rajeshkumar *et al.*, 2018, 2019; Vishnu Prasad *et al.*, 2018; Wahab *et al.*, 2018; Dua *et al.*, 2019; Duraisamy *et al.*, 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu *et al.*, 2019; Mehta *et al.*, 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran *et al.*, 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma *et al.*, 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi *et al.*, 2020; Samuel, Acharya and Rao, 2020)

No article was done based on the site specific lesions and hence This article aims to study the pulpectomy in the mandibular first primary molar due to class-I caries.

MATERIALS AND METHODS

Study population

A retrospective study was carried out in patients between the age of 4-11 years who visited University in Chennai who have undergone pulp therapy in deciduous mandibular molars Data from 1st June 2019 to 30th March 2020 was collected from patient records which includes details of patients, intraoral photographs and treatment being done.

Inclusion criteria

- Patients between the age of 6-11 years
- Both male and female
- Patients with occlusal caries (Class I) on mandibular primary molars

Exclusion criteria

- Tooth with caries on surfaces other than the occlusal surface

Sample size

Sample size [N=199] is the total number of patients who visited University in Chennai with occlusal caries on deciduous mandibular molars and underwent pulp therapy. Sample distribution according to age, gender and teeth number were recorded.

Ethical approval

Ethical clearance SDC/SIHEC/2020/DIASDATA/0619-0320.. was obtained from the Institutional Ethical Committee and Scientific Review Board [SRB] of University in Chennai.

Data analysis

The data was tabulated and analysed using IBM SPSS version 2.0. Non-parametric data were analysed using descriptive statistics measuring percentage and frequency. The association between pulpectomy in mandibular primary molar with occlusal caries with age, tooth affected and gender was done with Pearson's Chi-square test. The level of significance was $p < 0.05$.

RESULTS AND DISCUSSION

A total of 199 patients were seen during the study period. The prevalence of gender for pulpectomy in maxillary first primary molars with occlusal caries is higher in males patients with 55.78% (Figure 1) compared to the females 44.22%

The result (Figure 2) depicted that the age group between 4 to 5 years old has a higher prevalence of cases with 54.77% cases (109 patients). The least prevalent age group was age between 9 to 10 years old with only 11.56%. The result (Figure-3) also showed that right mandibular first primary molars (84) have higher in percentage in the occurrence of cases with 105 cases out of 199 with 52.76%. (Figure 3). In this present study, pulpectomy in mandibular first primary molar in occlusal caries was analyzed and correlated with gender, age group, and site of occurrence. All the pulpectomy cases with occlusal caries in tooth number 74,84 were segregated based on gender, age group, and their occurrence of site. Out of the total sample size, 199 patients, 111 patients were male, and 88 patients were female. The chi-square test shows the association between the gender and tooth number (p-value-0.942) and association between teeth number and the age group (p value-0.917) was found to have insignificant value $p > 0.05$ as depicted in (Figure 4) and (Figure 5).

This analysis reveals that 98% patients parents agreed with the negligence of oral hygiene. The pulp therapy is primary treatment to ensure the patient is revealed from pain and infection. There was a male predominance with 57% that correlates with the study done by Ahmed at all [(Ahmed, 2013)]. And also this study shown the Right mandibular primary molar (84) to have 53.7% and tooth Left mandibular primary molar (74) with 48.3% that correlates with the study done by Donald, et al et al. There was a mean age group 4-5 years was operated under partial and total pulpectomy. [(McDonald, Avery and Dean, 2011)] The failure and success of the pulp therapy depends on the sterilization of instruments and proper obturation.

Pulpectomy procedures provide the reasonable treatment option for primary molars having canals inflamed irreversibly or necrotic pulp [(Rodd *et al.*, 2006)] adequate knowledge on the root anatomical valuation and absolute awareness of the radiographic limitation, instrumental, chemical interaction among different endodontic lubricants, root canals filling techniques are essential pulp to commence pulpectomy procedure in exfoliation or retained primary molar. The post operative pulpectomy. It is performed to avoid the further complications. If left untreated can show the evidence of necrosis and suppression. However the source of infection should be treated. [(Pinky, Subbareddy and Shashibhushan, 2011)] 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)

CONCLUSION

There is no significant evidence that can correlate between gender and the occurrence of occlusal caries. The result concludes that Right primary mandibular molar is commonly affected in the male patients of 4-5 years of age group are found to be insignificant. Thus the current study depicted can be used as an estimation for early treatment diagnosis in pediatric practice and ensure the excellent treatment prognosis. Early detection of caries in a specific age group can be done.

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Authors Contributions

G.Harini has contributed in data collection, study design, data analysis, results, tables and manuscript preparation.

Dr. Bhagyalakshmi has contributed to manuscript preparation, proof reading of manuscript and reviewing the manuscript.

Dr. Balakrishna has contributed to reviewing the manuscript.

CONFLICTS OF INTEREST

None declared

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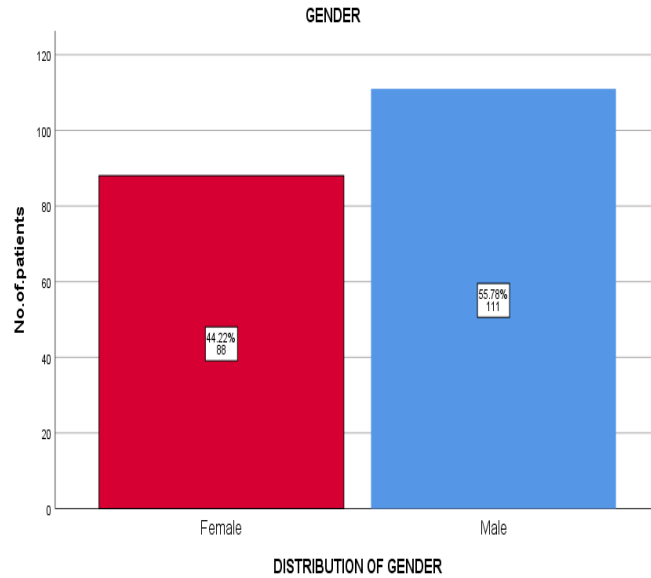


Fig.1: Bar chart showing the gender distribution in pulpectomy in mandibular first primary molars with occlusal caries. The X-axis shows the gender of patients and Y-axis shows the number of affected patients who underwent pulpectomy with occlusal caries in mandibular first primary molars. From the graph, we can understand that the most common gender that is affected by occlusal caries in the first primary molars is male (blue), with 55.76% compared to the females (magenta) (44.22%).

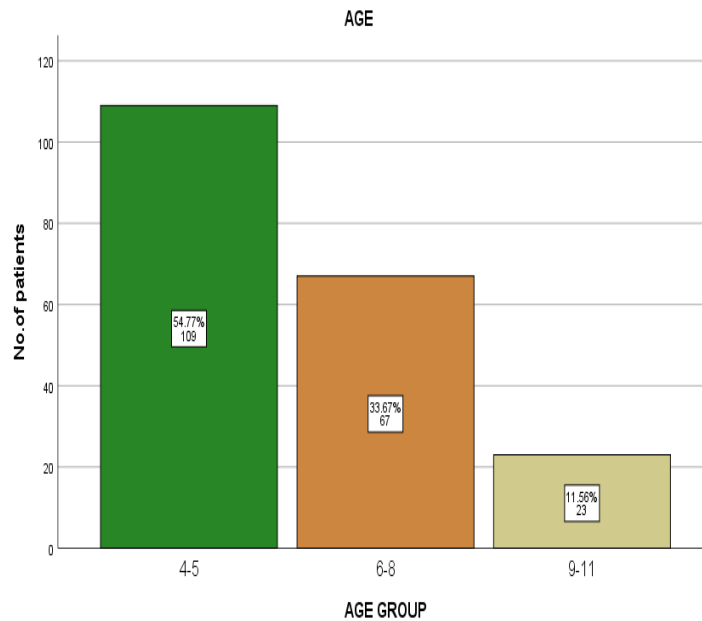


Fig.2: Bar chart showing the age distribution in pulpectomy in maxillary first primary molars with distal caries. The X-axis shows the age group of patients and the Y-axis shows the number of affected patients who underwent pulpectomy with occlusal caries in mandibular first primary molars. From the graph, we can understand that the most common age group that is affected by occlusal caries in the first primary molars is the 4 to 5 years old group (green) with 109cases (54.77%).

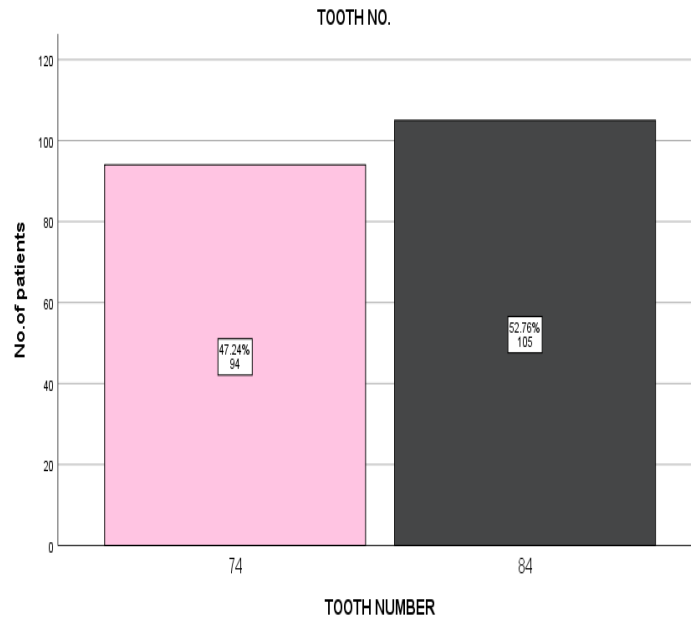


Fig.3: Bar chart showing the pulpectomies done in the right and left mandibular primary molar with occlusal caries. The X-axis shows the tooth in which pulpectomy was done and Y-axis shows the number of affected patients who underwent pulpectomy. From the graph, we can understand that most common teeth affected by occlusal caries are right with maxillary first primary molars (84 (black) with 105 cases (52.76%).

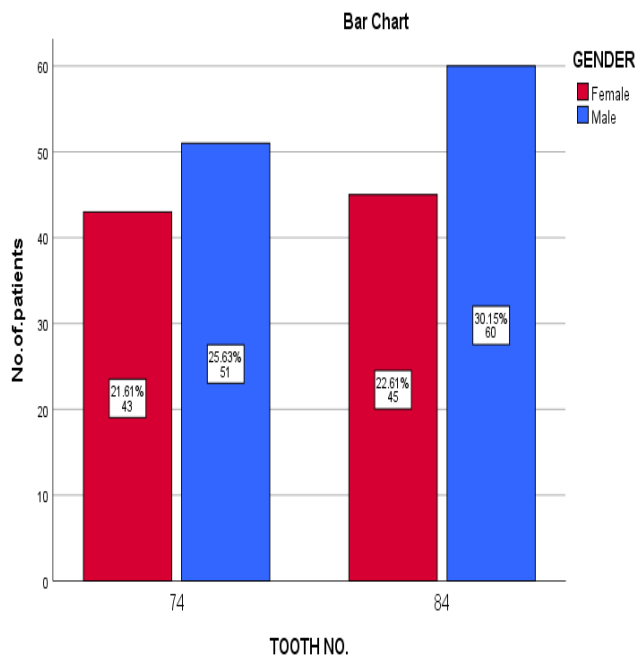


Fig.4: Bar chart showing the association between teeth number and gender (pink-female, blue-male). X-axis represents the tooth number, and the Y-axis represents the number of reported patients in gender wise. Majority of males are treated by pulpectomy in 84 (30.15%) followed by 74(25.63%)The Chi-square test was done to check the association between the tooth number and the gender of the patients, P-value=0.942, (P>0.05), which is statistically not significant. There is no significant association between gender and the tooth that was treated with pulpectomy.

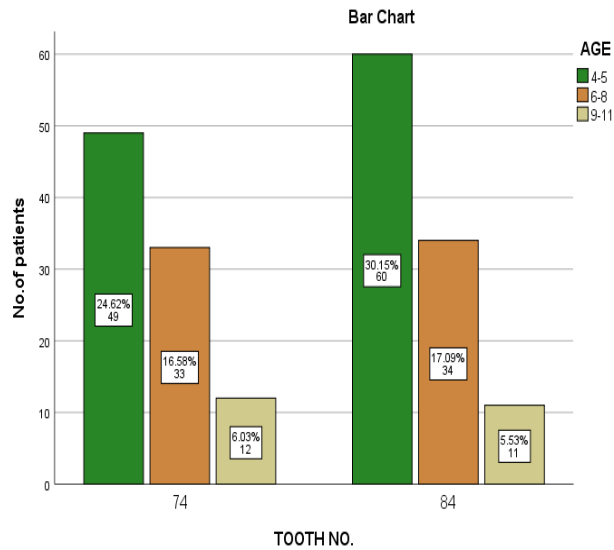


Fig.5: Bar chart showing the association between the teeth number and age group. X-axis represents the tooth number and the Y-axis represents the number of reported patients with different age groups: 4-5years; 6-8years;and 9-11 years. Majority of age groups between 4-5 years are treated by pulpectomy in 84(30.15%) followed by 74(24.62%). The Chi-square test was done and the association between the tooth number and age of the patient was found to be statistically not significant, since P-value=0.917, (P>0.05). However, Tooth number 84 and 74 was commonly affected in the age group of 4-5 years years(green).