Original Research Paper

Volume - 12 | Issue - 06 | June - 2022 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Paediatric Dentistry

PULPECTOMY IN MANDIBULAR SECOND PRIMARY MOLARS WITH CLASS 1 CARIES- A RETROSPECTIVE STUDY

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ABSTRACT Pulpectomy procedure is a conservative treatment approach to prevent the premature loss of deciduous teeth.The main aim of this study is to evaluate the pulpectomy procedure done in mandibular second primary molars with class 1 caries among children who reported for treatment in a private dental institution. A total of about 200 Intraoral periapical radiographs (IOPA) images were collected from the database record of the dental institution between June 2019-March 2020. Of these 200 IOPAs were selected based on the age group between 6-9 years old male and female children.The study was evaluated and approved by the ethical committee of the private dental institute. Data was statistically analysed using SPSS 2.0, Chi Square Test was conducted. The results were recorded. Among the study population 54.5% were 6 years old, 23.5% were 7 years old , 10.5% were 8 years old and 11.5% were 9 years old children. The predominant gender underwent pulpectomy procedure was male children which was 58% and female children were 42%. The most treated teeth was 85 (54%) when compared to tooth number 75 (46%). The association between the treated teeth and age showed p-value of 0.255(p-value > 0.05), the difference is statistically not significant. And the association between the gender and treated teeth showed p-value of 0.105 (p-value>0.05) which is statistically not significant. Within the limitations of study it was concluded that there is no significant evidence that can correlate between gender and teeth treated for class 1 caries. Also there is no significant association in between age and the teeth treated with pulpectomy procedure. In this study, the children at the age of 6 years predominantly underwent pulpectomy procedure and the predominant gender were males.

KEYWORDS : Class 1 caries, Mandibular primary molars, Partial pulpectomy, Pulp therapy, Total pulpectomy.

INTRODUCTION :

The purpose of pulp therapy in the primary dentition is to retain every primary tooth as a fully functional component in the dental arch and for the proper mastication, phonation, swallowing, preservation of the space required for permanent teeth eruption and to prevent the psychological effects of children due to tooth loss [1,2].

Pulpotomy procedure, a vital pulp therapy which denotes surgical removal of the entire coronal inflamed pulp leaving the vital radicular pulp intact within the canals, is the another accepted technique for treating primary teeth with irreversible inflammation that affects the pulp chamber. However, in cases of irreversibly inflamed and necrotic radicular canals, a successful pulpotomy procedure cannot be achieved, in that stage partial or total pulpectomy procedure is indicated 3,4. Total pulpectomy is the extirpation of normal or diseased pulp to or near the apical foramen. Partial pulpectomy is the extirpation of normal or diseased pulp of tooth with an incompletely formed root and an open apex.

Premature loss of primary molars can cause a number of undesirable complications including loss of arch length, insufficient space for erupting premolars and mesial tipping of the permanent molars –57. Pulpectomy of primary molar teeth is considered as a reasonable treatment approach for normal shedding of primary teeth and a long-term survival in instances of retention [8,9].

Riordan et al., reveal that pulpectomy procedure can be done on primary teeth even with evidence of chronic inflammation or necrosis of radicular pulp. Marsh et al., indicated that the goal of pulpectomy in primary teeth should be the decrease of bacteria in the contaminated pulp.

The complicating factors in the pulpectomy procedure are primary molar radicular morphology, inherent physiological root resorption and the close proximity of the permanent successor teeth. However, primary molar pulpectomy can be successfully treated with practice and appropriate patient selection [10].

Accurate working length determination is a hard procedure which is an initial step performing prior to pulpectomy in primary molar. Due to limitations of radiographic interpretation and high possibility of over-instrumentation of the unevenly resorbed roots and subsequent overfilling, the application of electronic apex locators can be used regardless of the stage of root resorption [11,12].

Ahmed et al., mentioned that pedodontists should be careful when selecting irrigating solutions due to the possible chemical interactions among different irrigants13. The formation of toxic interactions can be prevented by intermediate solutions such as saline or sterile distilled water, followed by careful drying [14,15].

The first and most widely accepted material for root canal filling in primary teeth is Unreinforced ZOE paste 16,17 .Iodoform-based pastes, such as KRI paste, were also recommended as root filling materials in primary molars.These pastes are easily resorbable from the periapical area and possess potent germicidal properties.

Vitapex, a combination of calcium hydroxide and iodoform, is another alternative that can be used easily. This material showed a favorable rate of resorption, reduced void formation and satisfactory radiographic and clinical outcomes.Few studies were reported with Metapex[18,19,20].

Endoflas F.S is another iodoform-based paste containing calcium hydroxide that also showed high clinical success rates [21,22,23].

Adequate knowledge on the root anatomical variations and absolute awareness of the radiographic limitations, instrumentation procedures, chemical interactions among different endodontic irrigants and root canal filling techniques are essential to commence pulpectomy procedures in exfoliating or retained primary molars.

The main purpose of the study is to evaluate the pulpectomy procedure done in mandibular second primary molars with class 1 caries among children who reported for treatment in a private dental institution and to analyse if there is any correlation between gender, age and the teeth affected with class 1 caries.

MATERIALS AND METHODS:

Study Setting:

The study was conducted with the approval of the Institutional Ethics Committee [SDC/SIHEC/2020/DIASDATA/0619-0320]. The study

consisted of one reviewer, one assessor and one guide.

Study Design:
The study was designed to include all children aged between 6-9 years male and female children and mandibular second primary molars with class 1 caries only included . The children who did not fall under this inclusion criteria were excluded.

Sampling technique:
The study was based on the Random sampling method. To minimise the sampling bias, all the cases were reviewed priorly and included.

Data Collection And Tabulation:
Data collection was done using the patient database with the timeframe work of 1st June 2019 to 30th April 2020. About 200 IOPAs and intraoral photographs were reviewed and those fitting under the inclusion criteria were included. Cross verification of data was done by a reviewer. The collected data was tabulated based on the following parameters:

- Patients demographic details
- Tooth number(mandibular second primary molars with class 1 caries)

Statistical Analysis:
The variables were coded and the data was imported to SPSS. Using SPSS Version 20.0 categorical variables were expressed in terms of frequency and percentage and bar graphs were plotted.The statistical significance of the associations were tested using the Chi-square test.

GRAPHS :

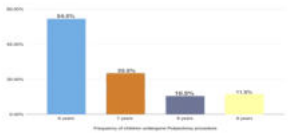

Figure 1: Shows the distribution of age of the male and female children who were included in the study. Among the study population 54.5% were 6 years old, 23.5% were 7 years old , 10.5% were 8 years old and 11.5% were 9 years old children.

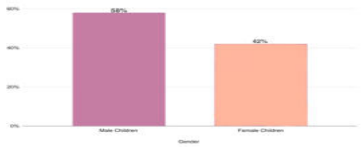

Figure 2 explains the distribution of gender of children who were included in the study. Among the study population 58% of children were males and 42% were female children.

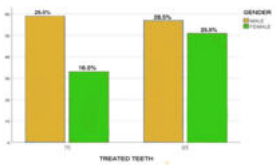

Figure 3 : The graph depicts the association between the treated teeth and gender.

X axis-distribution shows the teeth treated for class 1 caries and Y axis shows about gender distribution. 29.5% and 28.5% males underwent pulpectomy procedure in tooth number 75 and 85 respectively. Whereas 16.5% and 25.5% females were treated for class 1 caries in tooth number 75 and 85 respectively. However, the difference is statistically insignificant as the chi square test, p-value is 0.105 (p>0.05).

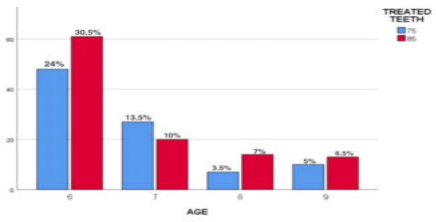

Figure 4 : The graph shows the correlation between the age and treated teeth. The X axis explains about the age distribution and Y axis distribution shows about the percentage of treated teeth. Among the 6 years old children 24% were treated in tooth number 75 and 30.5% were in tooth number 85. In 7 years old children , 13.5% and 10% were treated in tooth number 75 and 85 respectively, 3.5% and 7% of 8 years old children underwent pulpectomy in 75 and 85 respectively. Whereas 5% and 6.5% of 9 years old children were treated with pulpectomy in 75 and 85. The most predominant tooth treated with pulpectomy in this was 85.However, the difference is statistically insignificant as the chi square test, p-value is 0.255(p>0.05).

RESULTS AND DISCUSSION :
Among the study population 54.5% were 6 years old, 23.5% were 7 years old , 10.5% were 8 years old and 11.5% were 9 years old children. The predominant gender underwent pulpectomy procedure was male children which was 58% and female children were 42%. The most treated teeth was 85 (54%) when compared to tooth number 75 (46%). The association between the treated teeth and age showed p-value of 0.255(p-value > 0.05), the difference is statistically not significant. And the association between the gender and treated teeth showed p-value of 0.105 (p-value>0.05) which is statistically not significant.

In this study about 200 IOPAs and intraoral photographs were evaluated and segregated based on the age group of 6 to 9 years old male and female children. The pulpectomy procedure was usually done to maintain the tooth free of infection, to keep biomechanically clean, obturate the canals.The common contraindications for the pulpectomy are pathological resorption of at least 1/3rd of the root with fistulous, periradicular involvement, extensive pulp floor opening into the bifurcation, excessive internal resorption, primary tooth with underlying dentigerous.

(Figure 1) shows the distribution of age of the male and female children who were included in the study. Among the study population 54.5% were 6 years old, 23.5% were 7 years old , 10.5% were 8 years old and 11.5% were 9 years old children. The distribution of gender of children who were included in the study is shown in Figure 2. From the study population 58% of children were males and 42% were female children.

The most treated teeth was 85 (54%) when compared to tooth number 75 (46%). The predominant gender underwent pulpectomy procedure was male children which was 58% and female children were 42%. And the most frequent number of children treated for pulpectomy among the age group is 6 years old children.

The graph (Figure 3) depicts the association between the treated teeth and gender. X axis distribution shows the teeth treated for class 1 caries and Y axis shows about gender distribution. 29.5% and 28.5% males underwent pulpectomy procedure in tooth number 75 and 85 respectively. Whereas 16.5% and 25.5% females were treated for class 1 caries in tooth number 75 and 85 respectively. However, the difference is statistically insignificant as the chi square test, p-value is 0.105 (p>0.05).

In figure 4, the graph shows the correlation between the age and treated teeth. The X axis explains about the age distribution and Y axis distribution shows about the percentage of treated teeth. Among the 6 years old children 24% were treated in tooth number 75 and 30.5% were in tooth number 85. In 7 years old children , 13.5% and 10% were treated in tooth number 75 and 85 respectively, 3.5% and 7% of 8 years old children underwent pulpectomy in 75 and 85 respectively. Whereas 5% and 6.5% of 9 years old children were treated with pulpectomy in 75 and 85. However, the difference is statistically insignificant as the chi square test, p-value is 0.255(p>0.05). Based on this analysis there is no association in between gender,age and treated teeth.

In a previous study[24], Yuxiang Tang et al., discussed the therapeutic effects in pulpectomy which was statistically significant as the chi square test, p-value is 0.04 ($p<0.05$). In another study[25], Rodd et al., explained the importance of pulp therapy for primary molars which was about 90% clinically successful.

Limitations in this study were the selected age group of children, geographical limitation, and the sample size. In future scope study for larger populations has to be done; targeting excellent diagnosis and prognosis.

CONCLUSION :

The aim of this study is to evaluate the pulpectomy procedure done in mandibular second primary molars with class 1 caries among children who reported for treatment in a private dental institution and to analyse if there is any correlation between gender, age and the teeth affected with class 1 caries. There is no significant evidence that can correlate between gender ,age and pulpectomy treated teeth with class 1 caries. However children between the age group of 6-7 years old have high tendencies to develop deep class 1 caries which may lead to pulpectomy procedure. The most treated teeth was 85 (54%) and the predominant gender underwent pulpectomy procedure was male children which was 58%. The result of current study depicted can be used as estimation for early treatment diagnosis in paediatric practice and ensure the excellent treatment prognosis. Early detection of caries in specific age groups can be done.

ACKNOWLEDGEMENTS:

The authors thank and acknowledge Saveetha Dental College for providing access to use the retrospective data from the Pedodontic department for the study.

AUTHOR CONTRIBUTION:

J. Rubika has contributed to study design, data collection, analysis of the data, tabulation of results, manuscript typing. Dr.Bhagyalakshmi has contributed to study design, data collection,analysis of the data,tabulation of results, manuscript typing and formatting and critical reviewing. Dr. Srisakthi has contributed to formatting and proofreading

CONFLICT OF INTEREST:

This research project is self funded.There is no conflict of interest.

REFERENCES :

1. Bakland LK. The role of endodontics in pediatric dentistry. Endodontic Topics 2010; 23: 3–5.
2. Berk H, Krakow AA. A comparison of the management of pulpal pathosis in deciduous and permanent teeth. Oral Surg Oral Med Oral Pathol 1972; 34: 944–955.
3. Jeevanandan G. Kedo-S Paediatric Rotary Files for Root Canal Preparation in Primary Teeth - Case Report. J Clin Diagn Res 2017; 11: ZR03–ZR05.
4. Govindaraju L, Jeevanandan G, Subramanian EMG. Comparison of quality of obturation and instrumentation time using hand files and two rotary file systems in primary molars: A single-blinded randomized controlled trial. Eur J Dent 2017; 11: 376–379.
5. Aktan AM, Kara I, Sener I, et al. An evaluation of factors associated with persistent primary teeth. Eur J Orthod 2012; 34: 208–212.
6. Govindaraju L, Jeevanandan G, Subramanian EMG. Knowledge and practice of rotary instrumentation in primary teeth among indian dentists: A questionnaire survey. Journal of International Oral Health 2017; 9: 45.
7. Somasundaram S, Ravi K, Rajapandian K, et al. Fluoride Content of Bottled Drinking Water in Chennai, Tamilnadu. J Clin Diagn Res 2015; 9: Zc32–4.
8. Ahmed HMA. Anatomical challenges, electronic working length determination and current developments in root canal preparation of primary molar teeth. Int Endod J 2013; 46: 1011–1022.
9. Ravikumar D, Jeevanandan G, Subramanian EMG. Evaluation of knowledge among general dentists in treatment of traumatic injuries in primary teeth: A cross-sectional questionnaire study. Eur J Dent 2017; 11: 232–237.
10. Panchal V, Jeevanandan G, Subramanian EMG. Comparison of instrumentation time and obturation quality between hand K-file, H-files, and rotary Kedo-S in root canal treatment of primary teeth: A randomized controlled trial. Journal of Indian Society of Pedodontics and Preventive Dentistry 2019; 37: 75.
11. Govindaraju L. Clinical Evaluation of Quality of Obturation and Instrumentation Time using Two Modified Rotary File Systems with Manual Instrumentation in Primary Teeth. JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH. Epub ahead of print 2017. DOI: 10.7860/jcdr/2017/30069.10602.
12. Christabel SL, Linda Christabel S. Prevalence of Type of Frenal Attachment and Morphology of Frenum in Children, Chennai, Tamil Nadu. World Journal of Dentistry 2015; 6: 203–207.
13. Ahmed HMA, Abbott PV. Discolouration potential of endodontic procedures and materials: a review. Int Endod J 2012; 45: 883–897.
14. Kotlow L. Pulp Therapy for Primary Teeth. Lasers in Endodontics 2016; 157–169.
15. Packiri S, Gurunathan D, Selvarasu K. Management of Paediatric Oral Ranula: A Systematic Review. J Clin Diagn Res 2017; 11: ZE06–ZE09.
16. Gurunathan D, Shanmugaavel AK. Dental neglect among children in Chennai. J Indian Soc Pedod Prev Dent 2016; 34: 364–369.
17. Barcelos R, Santos MPA, Primo LG, et al. ZOE paste pulpectomies outcome in primary teeth: a systematic review. J Clin Pediatr Dent 2011; 35: 241–248.
18. Lakshmanan L, Mani G, Jeevanandan G, et al. Assessing the quality of root canal filling and instrumentation time using kedo-s files, reciprocating files and k-files. Brazilian Dental Science; 23. Epub ahead of print 2020. DOI: 10.14295/bds.2020.v23i1.1822.
19. Nair M, Jeevanandan G, Vignesh R, et al. Comparative evaluation of post-operative pain after pulpectomy with k-files, kedo-s files and mtwo files in deciduous molars -a randomized clinical trial. Brazilian Dental Science 2018; 21: 411.
20. Preethy NA, Jeevanandan G, Govindaraju L, et al. Comparative Evaluation of Apical Debris Extrusion Upon Use of Rotary Files and Hand Files for Root Canal Instrumentation in Primary Teeth. JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH. Epub ahead of print 2019. DOI: 10.7860/jcdr/2019/39904.12619.
21. Subramanyam D, Gurunathan D, Gaayathri R, et al. Comparative evaluation of salivary malondialdehyde levels as a marker of lipid peroxidation in early childhood caries. Eur J Dent 2018; 12: 67–70.
22. Govindaraju L, Gurunathan D. Effectiveness of Chewable Tooth Brush in Children-A Prospective Clinical Study. J Clin Diagn Res 2017; 11: ZC31–ZC34.
23. Fluoride, Fluoridated Toothpaste Efficacy And Its Safety In Children - Review. International Journal of Pharmaceutical Research; 10. Epub ahead of print 2018. DOI: 10.31838/ijpr/2018.10.04.017.
24. Tang Y, Xu W. Therapeutic effects of Pulpotomy and Pulpectomy on deciduous molars with deep caries. Pak J Med Sci Q 2017; 33: 1468–1472.
25. Rodd HD, Waterhouse PJ, Fuks AB, et al. Pulp therapy for primary molars. International Journal of Paediatric Dentistry 2006; 16: 15–23.