

Pulp therapies in young permanent mandibular molars with class 1 caries

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Abstract: The aim of this study is to assess the prevalence of pulp therapies in young permanent mandibular molars with occlusal caries. Exposure of pulp due to various reasons results in inflammation of the pulp which can lead to pulpal necrosis if left untreated. The study includes patients visiting the OP of University in Chennai who are diagnosed with Class I caries in the young permanent mandibular molars. The number of pulp therapy procedures done among the study population were assessed and the results were statistically analysed and graphs were tabulated. Among the total patients, it was found that a significantly high frequency (94.6%) of pulp therapy procedures were pulpectomies; and 58.1% of cases were done in the left mandibular first molar. This study shows that pulpectomy was highly performed over pulpotomy, although many researches state that pulpotomy is preferred for immature permanent teeth. This may be due to the extent of caries.

INTRODUCTION

The World Health Organization has declared dental caries as the most prevalent disease globally affecting 60-90% of school children in most industrialized nations. Dental caries can be defined as irreversible microbial disease causing demineralisation of organic portion leading to destruction of organic substance of tooth. Anatomical features and post-eruptive enamel maturation differ among different teeth, which determine their susceptibility to caries. Due to its high prevalence, various treatment options have already been known such as pulptherapy. Pulp therapy can be classified as vital & non vital pulp therapy. If it's a young permanent teeth, a vital pulp therapy can be performed. Vital pulp therapy treatment includes protective liner, direct pulp cap, indirect pulp treatment, apexogenesis, partial pulpotomy. Whereas a non vital pulp therapy treatment includes options such as pulpectomy and apexification. The main objective is to maintain integrity & health of teeth & supporting tissues significant in deciduous dentition and pulp preservation significant in primary molars. [1]

Many researchers have done such similar studies such as M Cvek et al who mentioned in his study partial pulpotomy as treatment option in young permanent teeth with deep carious lesions [2]. Similarly, O Backer Dirks et al did a longitudinal dental caries study in children 9-15 years of age [3]. In addition, Bhardwaj VK. conducted similar study of dental caries prevalence in individual tooth in primary and permanent dentition among 6-12-year-old school children in Shimla, Himachal Pradesh.[4].

According to his study it was found that the lowest caries prevalence (0.5%) was observed in central incisors while the highest prevalence (51%) in first molars. Also, Demirci, Mustafa et al. did a similar study of "Prevalence of caries on individual tooth surfaces and its distribution by age and gender in university clinic patients." [5]. Lastly, Muhammad Ashraf Nazir et al researched on First Permanent Molar Caries and its Association with Carious Lesions in Other Permanent Teeth [6].

The significance of this study is that in molars, pits and supplementary grooves are common which means there is a huge possibility of retention of food debris leading to carious attacks. Dental caries has been proven to be more commonly seen in mandibular arch than maxillary arch. Purpose of this study was to assess pulp therapies in young permanent mandibular molars with class 1 caries.

MATERIAL AND METHODS

A retrospective study was carried out in patients between the age of 6-11 years who visited University in Chennai who have undergone pulp therapy in young permanent mandibular molars. Data from 1st June 2018 to 30th March 2019 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 males and females are included, patients with occlusal caries (Class I) on young permanent mandibular molars. Exclusion criteria: Tooth with caries on surfaces other than the occlusal surface.

Sample size [N=74] is the total number of patients who visited University in Chennai with occlusal caries on young permanent mandibular molars and underwent pulp therapy. Sample distribution according to age, gender and teeth number were recorded. Ethical clearance was obtained from the Institutional Ethical Committee and Scientific Review Board [SRB] of University in Chennai.

The data collected was entered in an Excel sheet and subjected to statistical analyses using SPSS software. Descriptive statistics were done i.e frequency and cross tabulation. A chi square test was done between age and tooth affected. Independent variables are age and gender, while dependent variables are teeth number and surface affected. The level of significance was $p < 0.05$.

RESULTS AND DISCUSSION

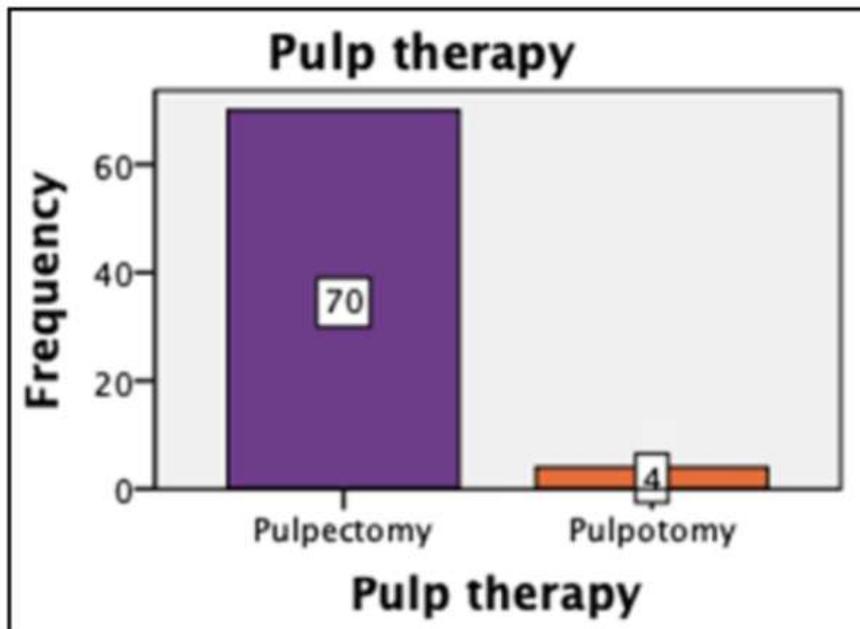


Figure 1. Shows the frequency distribution of the pulp therapies done among the study population.

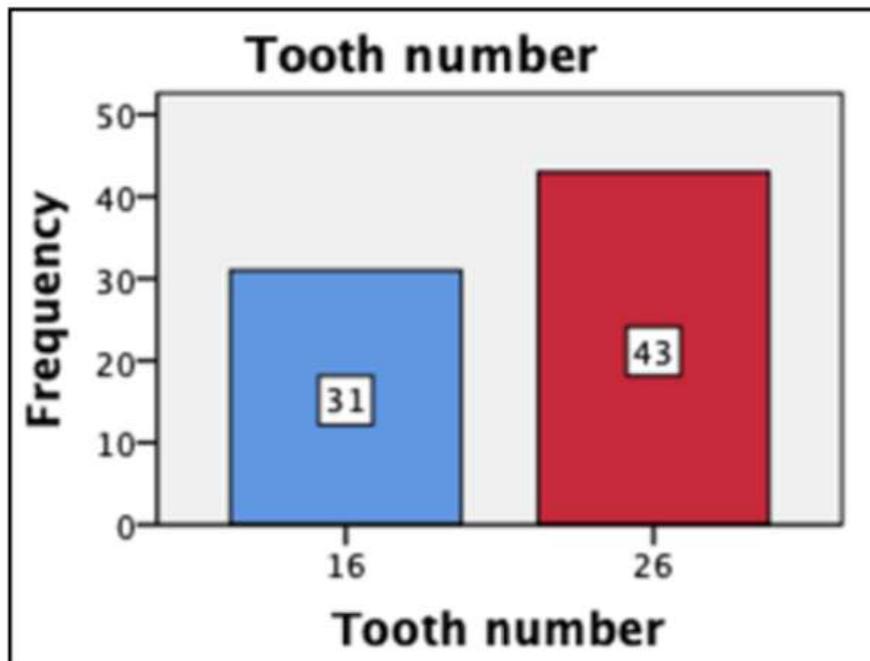


Figure 2. Shows the frequency distribution of the teeth affected among the study population.

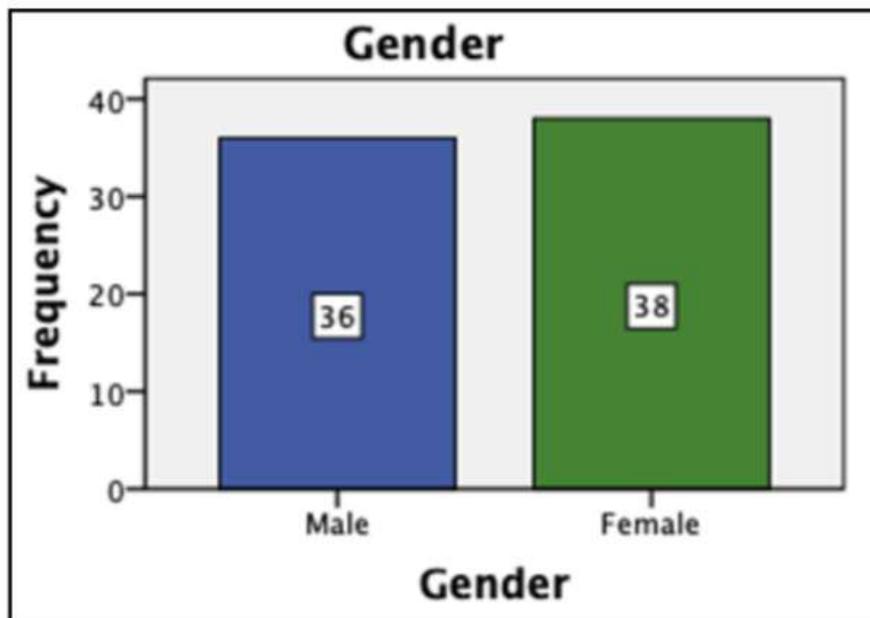


Figure 3. Shows the Gender distribution of the study population.

A total of 74 patients were seen during the study period. The most predominant pulp therapy procedure done was found to be the pulpectomy with a percentage of 94.6%. Pulpotomy on the other hand was only found to be 5.4% (Figure 1).It was found that the most commonly affected and treated teeth were the left permanent mandibular molar with a percentage of 58.1% and right permanent mandibular molar were about 41.9% (Figure 2). It was found the female distribution was higher with a percentage of 51.4% whereas males were about 48.6%. The statistical analysis Chi-square test shows p-value (0.069) more than the limit of significance $p < 0.05$, a negative correlation between the age of the patients and the pulp therapy procedures.

Pulpectomy procedures were most commonly performed for immature permanent mandibular molars in this study. According to a study by Raji Viola Solomon et al, 4 out of 5 cases of pulpotomy was successful and coronal pulpotomy was considered an alternative to pulpectomy procedures [16]. In a systematic review by Gunnar Bergenholtz et al, it is stated that it is not possible to determine whether an injured pulp by deep caries can be maintained or whether it should be removed and replaced with a root filling material [17].

George Bogen et al., in his study states that new treatment strategies for direct pulp capping and pulpotomy have shown promising potentials for improved outcomes in immature teeth with extensive caries [18]. Similarly, a study by Jekaterina Gudkind et

al,also states vital pulp therapy has been proven to be repeatedly successful and be recommended routinely for pulp exposure of immature permanent teeth [29]. A study by Imad Hassan et al shows that pulpotomy using MTA could be a good alternative for root canal therapy [20]. Considerable research has been conducted in the field of pedodontics with relevance to the current population under study [21-35]. This study helps to identify the prevalence of pulp therapies done in young permanent mandibular molars with Class I caries among the study population. Further studies with a larger population and considering the extent of caries is advised.

CONCLUSION

Root formation is not complete in young permanent teeth. Hence, preserving the pulp is necessary to help in the completion of the root ends. 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 prior to commencing pulpectomy procedures. Vital pulp therapy can be considered as an alternative to RCT in young permanent molars clinically diagnosed with irreversible pulpitis. In the current study, pulpectomy was highly performed over pulpotomy although many researches state that pulpotomy is preferred for immature permanent teeth. The future scope of this study is to consider the caries extent and to conduct the study among a larger population.

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