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Evaluation of requirement of extraction of a second maxillary primary molar in 3 to 5-year-old children

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Abstract--Background: The extraction of primary teeth is a major problem in developing countries. They are given little or no attention because they are thought to shed off on their own, resulting in significant difficulties such as crowding and malocclusion. Aim: The current aim of this study is to study the requirement of extraction of the second maxillary primary molar in 3 to 5-year-old children. Materials and Methods: A total of 136 children from the age group of 3-5 years who had undergone extraction of the second maxillary primary were collected from the DIAS record. The data were clubbed together and the results were analyzed using SPSS software the Pearson Chi-square test was done to find the sign where the p-value was kept <0.05 as the significance level. Results: The results show that 48.62% requirement for extraction is due to caries, 15.42% due

to trauma, 15.02% due to mobility, 7.15% due to root resorption, and 13.44% due to other reasons. Conclusion: The study concludes that despite the improvement in pediatric oral health, caries are found to be the main reason for extraction.

Keywords---3-5 year children, caries, extraction, second maxillary primary molar, Innovative technique.

Introduction

Humans have two sets of teeth, one set of primary teeth and the other set of permanent teeth, and are hence referred to as diphyodont. Primary teeth, also known as milk teeth or deciduous teeth, are the first 20 teeth to emerge from the gums (10 in each arch). These teeth appear in the sixth week of pregnancy. At the age of six months, the first primary tooth erupts in the oral cavity, and the eruption sequence is completed at the age of two years. From the age of 5 to 12 years, these teeth are functional, following which the permanent teeth begin to erupt in the oral cavity.

Primary teeth aid in chewing and talking, but their primary function is to serve as a pattern for the growing permanent teeth (1). Premature tooth loss causes faults in space reduction, which leads to malocclusion of subsequent teeth. Caries are the leading cause of primary tooth loss, followed by trauma and other factors (2)(3). Other causes include ectopic eruption and arch length limitations, which result in primary tooth resorption (4). Parent's lack of education and attitude toward dental treatment in primary teeth (5) leads to the prime solution of extraction of those affected teeth due to caries.

Previous research has concentrated on either a certain demographic group or a specific issue (6,7). Though studies reporting the reason for extraction of primary teeth in literature (8), very little information is available regarding the requirement of extraction. In order to minimize primary tooth loss, it is important to understand the factors which lead to such loss. The aim of this study is to evaluate the requirement for extraction of the second maxillary primary molar in 3 to 5-year-old children. Our team has extensive knowledge and research experience that has translated into high-quality publications (9–21)(22–28).

Materials and Method

The present study was designed as a retrospective study and was conducted in the Department of Pedodontics, Saveetha dental college and hospital, Chennai to evaluate the requirement of extraction of a second maxillary primary molar in 3-5 years old children. The required data was taken from DIAS i.e dental information archiving software records of Saveetha Dental College, Chennai. All the children between 3 to 5 years with missing second maxillary primary molar were included in the study. Age, gender, the requirement of extraction were evaluated and tabulated. The collected data was validated, tabulated, and analyzed with Statistical Package for Social Sciences (SPSS) for Windows, version 26, and results were obtained. Categorical variables were expressed in frequency and

percentage. The Chi-square test was used to test associations between categorical variables. P-value < 0.05 was considered statistically significant.

Results:

A total of 136 children from the age group 3-5 years old who had undergone extraction of the second maxillary primary molar. The obtained results show that the second maxillary primary molar is required to extract due to the caries prevalent which is about 48.80%.

Figure 1 shows a majority of about 48.62% extracted due to caries. Figure 2 shows the bar graph in association with that of the gender and the requirement of extraction of the second maxillary primary molar. Figure 3 shows bar graph in association between gender and the requirement of extraction of the second maxillary primary molar in 3 to 5 year old. Majority of about 22.06% of extraction was done in boys due to involvement of caries in comparison to others. Figure 4 shows the error bar graph in association with that of the requirement of extraction of the second maxillary primary molar in 3 to 5 year old. A Majority of about 41.18% of the extraction were done due to the involvement of caries.

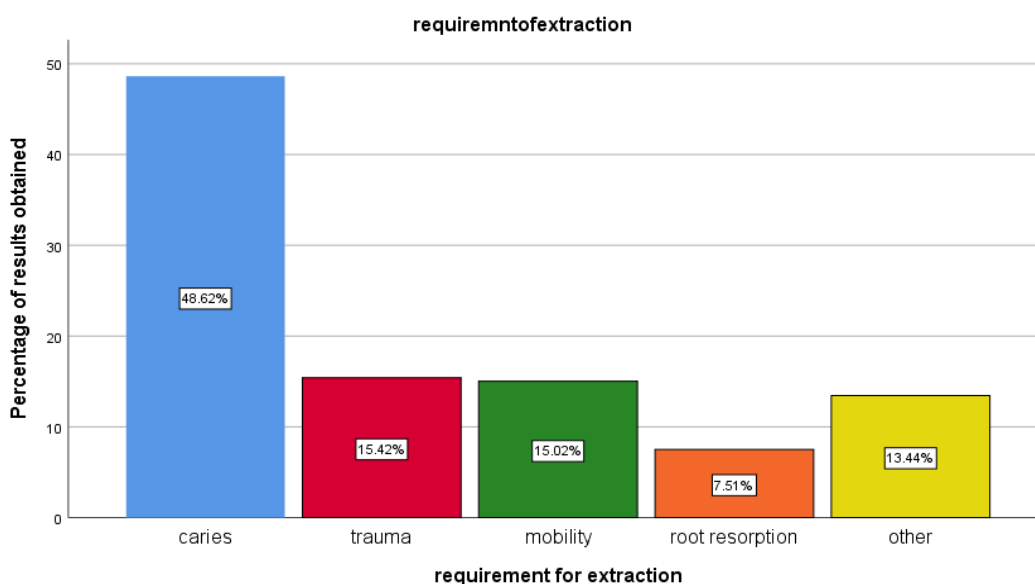


Figure 1 shows a bar graph depicting the results for the extraction of a second maxillary primary molar. Where X represents the need for extraction and Y axis represents the results obtained for the same. Blue colour denotes teeth extracted due to caries, red colour denotes teeth extracted due to trauma, green colour denotes teeth extracted due to mobility, orange colour denotes teeth extracted due to root resorption and yellow colour denotes teeth extracted due to other reasons, show a majority of about 48.62% extracted due to caries.

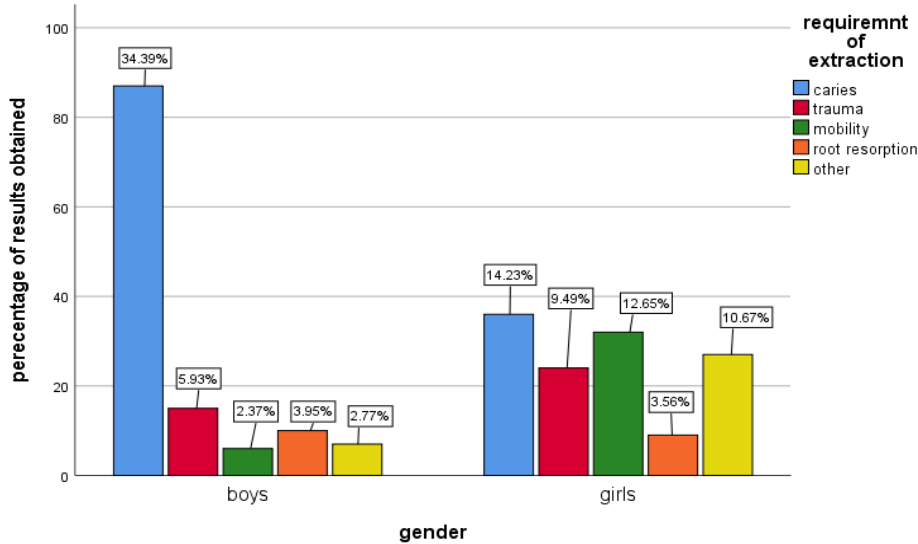


Figure 2 shows the bar graph in association with that of the gender and the requirement of extraction of the second maxillary primary molar. Where X-axis represents the gender and Y-axis represents the percentage obtained for the various reasons of extraction. Blue colour denotes teeth extracted due to caries, red colour denotes teeth extracted due to trauma, green colour denotes teeth extracted due to mobility, orange colour denotes teeth extracted due to root resorption and yellow colour denotes teeth extracted due to other reasons. Pearson Chi-square test shows p value=0($p<0.05$) thereby the data is statistically significant.

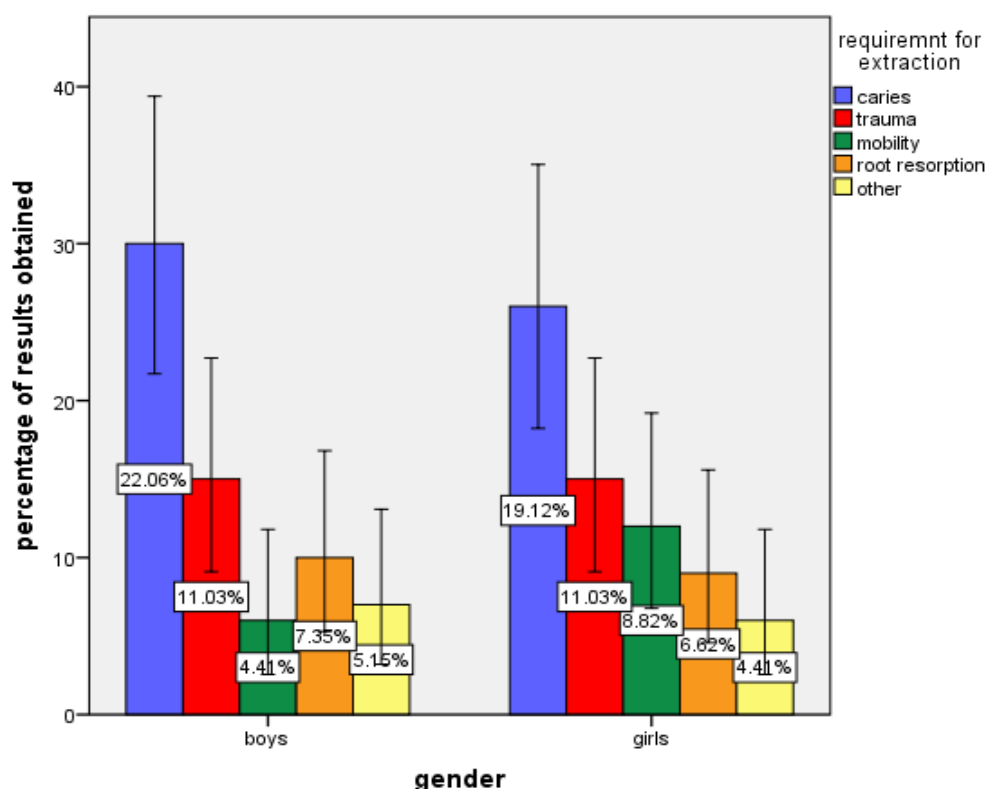


Figure 3 shows bar graph in association between gender and the requirement of extraction of the second maxillary primary molar in 3 to 5 year old. Yellow colour denotes requirement for other purposes. Orange colour denotes extraction due to root resorption. Green colour denotes Extraction done due to mobility of the tooth. Red colour denotes extraction done due to trauma and Blue colour denotes extraction done due to involvement of caries. Majority of about 22.06% of extraction was done in boys due to involvement of caries in comparison to others.

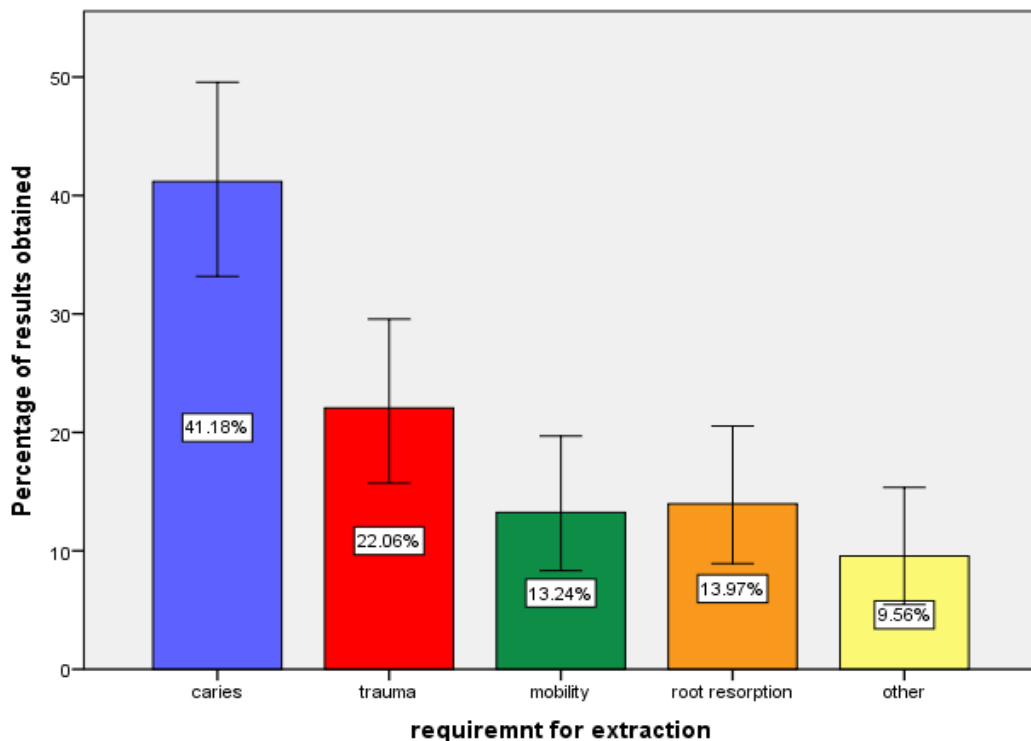


Figure 4 shows the error bar graph in association with that of the requirement of extraction of the second maxillary primary molar in 3 to 5 year old where yellow colour denotes requirement for other purposes. Orange colour denotes extraction due to root resorption. Green colour denotes Extraction done due to mobility of the tooth. Red colour denotes extraction done due to trauma and Blue colour denotes extraction done due to involvement of caries. A Majority of about 41.18% of the extraction were done due to the involvement of caries.

Discussion

The availability of dental therapy, the incidence of oral illness, and attitudes regarding tooth loss can all be gleaned from a population's tooth mortality. Though a lot of research has been conducted in permanent dentition to find out the causes of tooth loss, not more studies have been conducted to find the causes of tooth loss in primary dentition. Primary tooth extraction is a fairly common procedure in children's dentistry, and it's commonly included in treatment programs for caries, trauma, or orthodontic issues. Caries and pulpal disease usually demand primary tooth extractions, with pulpal and periapical illness, which is untreatable by pulp therapy, accounting for 53 percent of the teeth lost. Despite significant improvements in juvenile oral health over the last decade, new evidence reveals that dental disease is still a major cause of tooth loss in children. According to studies conducted in the previous several decades, the incidence of dental caries among youngsters in the United States appears to be centered in the 20-25 percent range. In rural places, access to oral cavity hygiene is quite limited. The reason that primary teeth are lost at an early age is due to the parents' lack of understanding of their values.

The major cause of tooth loss still remains to be dental caries despite various awareness and preventive protocols and is evident from the data obtained in the present study as depicted in Figure 1. However the other causes of tooth loss includes those related to dental development and orthodontic considerations. Trauma is yet another reason that contributes to 15.42% of tooth loss in pediatric population. Similar results were found in a previous study done by Caldas AF et al reported that caries was a major reason for tooth extraction followed by traumatic cases (29). [Figure 2] shows the association between gender and the requirement of extraction of the maxillary second primary molar where ($p < 0.05$) shows the data is statistically significant. Extraction due to trauma also increases with age. In the present study, boys are more affected by caries than girls which corroborate with a previous study done by Cavalcanti AL et al (30) this could be attributed to the behavioral changes that happen over time.

Conclusion

The study concludes that the majority of the requirement for extraction of the second maxillary molar in the 3-5 years age group of children is due to caries that is prone to infection. Preventive measures to decrease the incidence of dental caries in primary teeth should be started right from the eruption of the first primary teeth.

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Conflict Of Interest

The author declares that they have no conflict of interest for this study.

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Ethical Clearance

Taken from Saveetha Institute Human Ethical Committee.

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