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Distribution of Children Based on the Type of Terminal Plane In Primary Dentition: A Study Among 3 To 5-Year-Old Children in Chennai

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ABSTRACT

The aim of the study is to assess the distribution of children based on the type of terminal plane in primary teeth among children of 3 to 5 years of age. A total of 200 children of 3-5 years were included in the study. The data of the children were obtained by analysing the patients records, Saveetha Dental College And Hospital. The molar relation of these children were recorded based on the terminal planes. Data obtained were tabulated in excel and imported to SPSS version 20 software. Frequency distribution and Chi-square tests were carried out to determine statistical significance. From the present study it was found that among the 200 children, 118 were male (59%)and 82 were female children (41%). 25.5% of children included in the study were 3 years, 42.5% of children were 4 years, 32% of children were 5 years. Majority of children exhibited flush terminal molar relation by 44.5, 30.5% of children showed mesial step, and distal step was seen in 25% of children. The association between gender and type of malocclusion shows that flush terminal was more prevalent in male genders P value p<0.05. The association between age and gender of the children shows statistical significance P value p<0.05. Flush terminal plane is the most common primary molar relation found in the present study. Flush terminal was more prevalent in boys than girls which was statistically significant.

KEY WORDS: DISTAL STEP, MESIAL STEP, MOLAR RELATION, PRIMARY DENTITION, TERMINAL PLANE.

INTRODUCTION

The occlusal relationship of primary dentition will determine the occlusion of the permanent dentition (Bishara et al., 1988). The characteristic features of the primary dentition lays the foundation for the proper

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NAAS Journal Score 2020 (4.31) SJIF: 2020 (7.728) A Society of Science and Nature Publication, Bhopal India 2020. All rights reserved. Online Contents Available at: http://www.bbrc.in/ Doi: http://dx.doi.org/10.21786/bbrc/13.8/176 eruption and alignment of the succeeding dentition. The functions of primary dentition are maintenance of the occlusion and space for the permanent dentition in addition to mastication(Wright and Kennedy, 1978). Primary dentition is divided into spaced and non spaced dentition (Baume, 1950). Spaced dentition is when there is a good amount of spaces between the teeth. This space helps to accommodate larger size permanent teeth. Space found in a primary dentition are of two types physiological space and primate space. Physiological space is present between the primary teeth. Primate space is present between lateral incisor and canine in maxilla and canine and deciduous first molar in the mandible. They are also called anthropoid space or simian space (Nakata and Wei, 1988).



The primary dentition is complete once the second primary molars erupts (Sriram et al., 2012). Occlusion of primary molars can be divided into three – flush terminal plane, distal step, and mesial step. In flush terminal plane distal surfaces of the maxillary and mandibular second primary molars are in the same vertical plane in centric occlusion. In distal step the distal surface of the mandibular second primary molar is more distal to that of the maxillary molar in centric occlusion and in mesial step the distal surface of the mandibular second primary molar is more mesial to that of the maxillary molar in centric occlusion (Foster, 1975; Moyers, 1988).

Determining the primary molar relationship is very important as it reflects the molar relationship and possible malocclusion of future permanent molar. Flush terminal plane will lead to end on relationship of permanent molars or to Class I permanent molar occlusion with forward growth of mandible. The mesial step will lead to Class I permanent molar relationship and Class III molar relationship with forward growth of mandible. The distal step will lead to Class II permanent molar relationship and with the forward growth of mandible it can lead to end on relationship of permanent molars (Srinivasan et al., 2017).Occlusion in primary dentition plays a major role in determining the occlusion of the permanent dentition.

Our department is passionate about child care,we have published numerous high quality articles in the domain over the past 3 years (Christabel and Gurunathan, 2015: Somasundaram et al., 2015: Gurunathan and Shanmugaavel, 2016; Govindaraju and Gurunathan, 2017; Govindaraju, Jeevanandan and E. M. G. Subramanian, 2017a, 2017b; Govindaraju, Jeevanandan and E. Subramanian, 2017; Jeevanandan, 2017; Packiri, Gurunathan and Selvarasu, 2017; Ravikumar, Jeevanandan and Subramanian, 2017; 'Fluoride, Fluoridated Toothpaste Efficacy And Its Safety In Children - Review', 2018; Jeevanandan and Govindaraju, 2018; Nair et al., 2018; Subramanyam et al., 2018; Panchal et al., 2019). With this inspiration we planned to pursue research on 'Distribution Of Children Based On The Type Of Terminal Plane In Primary Dentition: A Study Among 3 To 5-year-old Children In Chennai'. This study aims to assess the distribution of children based on the type of terminal plane in primary teeth among children of 3 to 5 years of age.

MATERIAL AND METHODS

A cross-sectional study was conducted among children of age 3 to 5 years visiting Saveetha Dental College and Hospital, Chennai. Ethical approval for the study was obtained by the Institutional Review Board (IRB Approval No: SIHEC/2020/DIASDATA/0619-0320). The data were collected after reviewing patients' records between June 2019 to March 2020. A total of 200 children of age between 3-5 years were assessed to determine the type of molar relationship , age, and gender. Inclusion criteria was children of 3-5 years, presence of complete set of primary dentition.Exclusion criteria were children with missing teeth , Children with extensive caries, permanent first molars erupted. Children who fulfilled the inclusion criteria were identified and the clinical photographs obtained from the patients records were evaluated to determine the type of molar relationship (Flush terminal,mesial step,distal step).The data were recorded and tabulated in excel sheets which were imported to IBM SPSS version 20. Descriptive statistics and Chi square test was used to determine the association between the variables where P value < 0.05 is considered statistically significant.





Figure 2: depicts the age distribution of children with different types of malocclusion. Children of 3 years (25.5%), children of 4 year (42.5%) and children of 5 years (32%).



RESULTS AND DISCUSSION

In this present study we assessed the molar relation of the primary dentition of 200 children aged 3 to 5 years. Among the 200 children, 118 were male (59%)and 82 were female children (41%) who were assessed for the prevalence of different types of molar relationship for primary teeth (figure 1). 25.5% of children included in the study were 3 years,42.5% of children were 4 years, 32% of children were 5 years (figure 2). Out of the 200 patients , majority of children exhibited flush terminal molar relation by 44.5%, 30.5% showed mesial step, and distal step was seen in 25% (figure 3). The association between gender and type of malocclusion shows that flush terminal was more prevalent in male genders P value 0.043 (p<0.05) (figure 4). The association between age and gender of the children shows statistical significance P value 0.044 (p<0.05) (figure 5).

Figure 3: depicts the distribution of different types of molar relation in children. Maximum number of children exhibited flush terminal by 44.5% and least number of children showed distal step by 25%.



Figure 4: depicts the association between gender and types of molar relation. From the graph we can infer that flush terminal was more prevalent in male genders P value 0.043 (p<0.05). Hence statistically significant.



Figure 5: depicts the association between gender and age of children with different types of malocclusion. From the graph we can infer that male children of age 4 years showed the maximum number of malocclusions(53). P value obtained was 0.044 (p<0.05). Hence statistically significant.



The occlusion of the primary dentition is completely established by 3 years of age and lasts till about 6 years of age when the first permanent tooth starts erupting (Farsi and Salama, 2009). Better understanding of the association between morphological aspects of the primary dentition and its transition to permanent dentition provides the possibility of predicting the final permanent occlusion (Dutra et al., 2009). It is very crucial for clinicians in order to plan early interceptive treatment. Early treatment would reduce the percentage of permanent teeth extractions and also reduce overall treatment period as well as increase the likelihood of gaining better aesthetic and functional results(Ngan and Fields, 1995). The predominant primary molar relation is flush terminal plane followed by mesial and distal step (Baume, 1950; Boyko, 1968; Otuyemi et al., 2003; Farsi and Salama, 2009). The flush terminal plane was found to be the most common molar relation and considered ideal for transition to class 1 in permanent dentition (Bishara et al., 1988; Anderson, 2007).

In the present study majority of children exhibited flush terminal molar relation (44.5%). Similarly in a study conducted by Madhuri Vegesna et al., it was reported that the majority of children had flush terminal molar relations by 80.3% (Vegesna, Chandrasekhar and Chandrappa, 2014). In a study conducted by C. H. Sriram et al., it was reported that bilateral flush terminal plane were more prevalent in children (Sriram et al., 2012). A study conducted by Najat Ma Farsi reported that 80% of the children had a flush terminal plane molar relationship (Farsi and Salama, 2009). In another study conducted by Sapna Hegde et al., with a dissimilar finding it was reported that 50% of children had mesial step as the most common type of molar relationship (Hegde et al., 2012).

In yet another study with dissimilar findings it was reported that distal step was more prevalent in primary dentition(Al-Sehaibany and Aljubour, 2018). In the present study it was found that there is an association between gender and the type of malocclusion. Flush terminal was more prevalent in both the genders P value 0.043 (p value<0.05), statistically significant. In a previous study conducted by Madhuri Vegesna., with a similar finding reported that there is a significance between gender and type molar relation (p<0.05). In a study conducted by Daya Srinivasan et al., it was reported that there is no significance between gender and type of malocclusion (p>0.05). Similarly in another study conducted by Vijayakumar Anu et al., with a dissimilar finding it was reported that there is no association between gender and type of malocclusion (p value 0.066).

CONCLUSION

Within the limits of the study, flush terminal plane was the most common primary molar relation.Flush terminal was more prevalent in male children which was statistically significant. Early preventive and interceptive measures are necessary to reduce the prevalence of future developing malocclusion and further adverse effects.

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