

Original article

Malocclusion in deciduous dentition of Saudi children: A cross-sectional study

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Abstract:

Background: Occlusal characteristics of the primary dentition vary among populations and ethnic groups.

Materials and Methods: This cross-sectional study aimed to record various primary dentition parameters in 700 Saudi children, 2-6 year-old, was divided into 4 age groups and was randomly selected to observe the differences between the age groups. **Results:** 55.6% of the children had a 'flush terminal plane' molar relationship. The proportion of children with distalstep molar relationship was significantly lower 23 (3.2%). The degree of overbite was significantly less in the 5-year-olds than in the 3-year-olds. The majority of the children (80.7%) had spaced dentition. The prevalence of anterior cross bite was 0.7% and of open bite was 0.3%.

Keywords: Malocclusion, Deciduous dentition, Spacing, Crowding, Crossbite

Introduction:

Childhood is the mirror in which are reflected the propensities of adulthood. The individual with malocclusion may feel shy in social contacts, may lose career opportunities and might feel shame about their dental appearance¹. The reason to develop malocclusion could be genetic or environmental and, or combination of both the factors along with various local factor such as adverse oral habits, tooth anomalies, form and developmental position of teeth can cause malocclusion². The malocclusion has been showed to affects oral health, increased prevalence of dental caries and can cause temporomandibular joint disorders². The prevalence of malocclusion varies from country to country and among different age and sex group. Ideal primary dentition is the indicator of future ideal permanent dentition. Occlusal relationship, spacing and crowding in the primary dentition, and their significance for the development of the permanent dentition have been subjects of discussion for several decades^{3,6}. Various functions of the deciduous dentition are to provide mastication as well as to maintain the occlusion and space for the permanent dentition⁷.

Bogue (1908) stated that if malocclusion was found in the primary dentition, the same occlusal problems would be expected to occur in the succeeding permanent dentition, and to a more pronounced degree⁸. One important aspect of occlusal development in the primary dentition is the early recognition of incipient occlusal disharmonies which may necessitate orthodontic intervention⁴.

Occlusion constitutes one of the important objectives of pedodontic treatment whether it is preventive, interceptive, or corrective. The understanding of the anteroposterior changes that occur in the occlusion between the deciduous and permanent dentition is crucial for the clinician involved in early orthodontic treatment.

The purpose of this study is to determine the prevalence of malocclusion in the primary dentition in children attending the Department of Pediatric Dentistry at College of Dentistry King Khalid University, Abha.

Materials and Methods:

The subjects of this cross-sectional study are the patients attending the Department of Pediatric Dentistry at College of Dentistry King Khalid University, Abha. Seven hundred (700) children below 6 years were included with all deciduous teeth present and were divided into 4 age groups as 2-3 years (44), 3-4 years (323), 4-5 years (227) and 5-6years (106) shown in Table 1.

The clinical examinations were performed by experienced clinicians in those children who fulfilled the required inclusion criteria. The examiners received training and were calibrated against each other prior to this study.

Inclusion criteria:

- 1) The school children below six years of age
- 2) All deciduous teeth should be present

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Exclusion Criteria:Subjects with erupted permanent first molar/incisor tooth.

All irregularities including spacing, crowding and closed dentition were examined in relation to primary dentition. The criteria used to designate malocclusion are listed below:

Molar occlusion

Flush Terminal plane (Endon relation): when the distal surfaces of upper and lower second primary molars were in the same vertical plane in centric occlusion

Distal step: when the distal surface of the lower second primary molar was in posterior relationship to distal surface of upper second primary molar.

Mesial step: when the distal surface of the lower second primary molar was in anterior relationship to distal surface of upper second primary molar.

Crowding: Crowding is defined as any tooth rotated, or out of line for which space should be created to allow correction of malalignment.

Overjet: was measured in centric occlusion as the greatest distance between the incisal edges of the maxillary and mandibular primary incisors in the occlusal plane using a millimeter gauge and recorded as 'ideal' if a positive overjet was less or equal to 2 mm.

Overbite: normal overbite was defined as covering the middle third of the mandibular incisors by the maxillary incisors.

Anterior crossbite: malocclusion resulting from the lingual positioning of the maxillary anterior teeth in relationship to the mandibular anterior teeth.

Openbite A negative overlap in the vertical plane was recorded as an anterior open bite.

Spacing conditions were registered for contact areas between the teeth space?2 mm.

Collected data was statistically analyzed and expressed in percentage. The study was approved by 'Research and ethics committee of the Department of Pediatric Dentistry at College of Dentistry King Khalid University, Abha'.

Result:

1) Sample size: Out of 700 children 58% of them were males and 42% of them were females.

Terminal plane relationships shown in the Table II and Figure I

3) Alignment: 80.7% of children had spaced dentition and 13.3% and 6% Of children had closed dentition and crowding respectively is shown in Table III.

4) Other abnormalities: The over jet relationship in the 700 children examined as shown in Table-IV, were as follows: Edge to edge relation was present in 1.5%(11), openbite in 0.3%(2) of children and anterior crossbite in 0.7 %(5) of them.

Table 1: Age distribution

NO.	AGE	TOTAL	PERCENTAGE
1	2-3	44	6.3%
2	3-4	323	46.1%
3	4-5	227	32.4%
4	5-6	106	15.2%

Table II: Terminal Plane Relationship

	Male	Female	Total	Percentage
Endon relation	226	163	389	55.6%
Mesial step	173	115	288	41.2%
Distal step	7	16	23	3.2%

Table III: Distribution of Teeth alignment

	Male	Female	Total	Percentage
Spacing	325	240	565	80.7%
Closed dentition	59	34	93	13.3%
Crowding	22	20	42	6%

Table IV: Other Variations

	No.	Percentage
Edge to Edge	11	1.5
Open bite	2	0.3
Ant. Crossbite	5	0.7

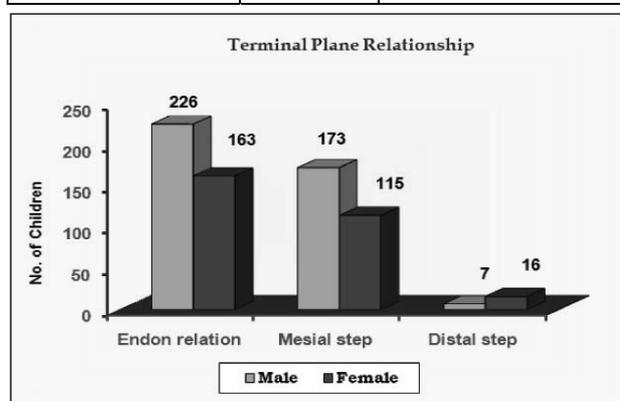


Figure 1: Graphical representation of Terminal Plane Relationship

Discussion:

A cross sectional study was conducted in 700 Saudi children below 6 years was examined for malocclusion in primary dentition. Farsi(1996) conducted cross-sectional study in Saudi children to know various malocclusion parameters in primary dentition and observed that 80% of children had flush terminal plan molar relation as compared to 55.6% in our study⁹. In our study distal step molar relation 3.2% was observed as compared to study conducted by Farsi (1996), it was 7%⁹. A study conducted to assess the changes in the molar relationship from deciduous to permanent dentition concluded that, a distal step in deciduous dentition ended in a class II molar relationship, 56% of the cases with flush terminal plane resulted in Class I molar relationship and 44% into Class II molar relationship. Mesial step in deciduous dentition suggests a greater probability to Class I molar relationship and a lower probability for Class II molar relationship¹⁰. The terminal relationship patterns seemed to change with age, and this was caused by mesial migration of the mandibular arch and by mesial mandibular shift⁶. Prevalence of anterior crossbite in our study observed significantly low 0.7, as compared to study conducted by Farsi (1996) in Saudi children was 2%⁹. A study conducted to assess molar relationship and anterior and posterior cross bite on black and white-people within the age groups of 2 to 5 years conclud-

ed that the ethnic background has some effect on malocclusion. The prevalence of Class II molar relationship and anterior cross bite was more in black whereas Class III relation was more in white people. There was no significant difference between genders of same group¹¹.

Dong-Hyuk Im et al (2006) showed that in both sexes, spacing in the primary dentition was more frequent in the maxilla than in the mandible¹². Baume (1950) reported that in children 14.9% of crowding was seen in the mandible¹³. El- Nofely A et al (1989) reported that children with spaced dentition have small mesodistal crown diameters and wide inter canine width¹⁴. Leighton's hypothesis suggests that there should be a 6mm or more space between the mandibular teeth in order for there to be no chance of developing incisor crowding in the permanent dentition. Hence the results in our present study showed 80.7% children had spacing who have less chances of developing malocclusion, 13.2% of children had closed dentition and 6% had crowding which showed that these children have more frequency of developing malocclusion and our study also showed that spaced dentition was seen more in males when compared to females depicting that the frequency of developing malocclusion was more in females than in males.

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