EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 7
Issue: 1
567-572
Year: 2020

TO STUDY THE CHARACTERISTICS OF SPACING IN PRIMARY DENTITION IN PRE SCHOOL CHILDREN-AN EPIDEMIOLOGICAL STUDY

Dr. Shazia Nabi*, Dr. Shakir Hussain Rather, Dr. Nazir Ahmad Shah, Dr. Showkat Maqbool, Dr. Gagandeep Kaur

Dept. of Paediatric Dentistry RUHS, Rajasthan.

***Corresponding Author: Dr. Shazia Nabi**
Dept. of Paediatric Dentistry RUHS, Rajasthan.

Article Received on 21/11/2019 **Article Revised on 11/12/2019** **Article Accepted on 31/12/2019**

ABSTRACT

The proper maintenance of normal occlusion primarily constitutes one of fundamental objectives of pediatric dentistry. Many research papers and study are available that establishes various occlusal characteristics of primary dentition in the preschool children. The objective of our study was to study the characteristics of spacing in primary dentition in pre school children of 3 and 5 years of age.

INTRODUCTION

Occlusion in the primary dentition plays a significant role in determining the space for the occlusion in the succeeding permanent dentition. Occlusion is defined a manner in which the upper and lower teeth inter-cuspate between each other in all mandibular positions and movements. It is a result of neuromuscular control of the components of the mastication systems namely: teeth, periodontal structures, maxilla and mandible, temporomandibular joints and their associated muscles and ligaments.[1]

The primary dentition is completed with the eruption of 2nd primary molar, so at this time location for the eruption of permanent teeth in future has been determined.

Angle had provided the first clear definition of normal occlusion. The normal occlusion is when the upper and lower molars were in a relationship whereby the mesiobuccal cusp of the upper molar occluded in the buccal grove of the lower molar and the teeth were arranged in a smoothly curving line of occlusion.[2]

Andrews reported of six significant characteristics consistently observed in 120 casts of non-orthodontics patients with normal occlusion. As the reference point, he used the centre of the clinical crowns and measured the thickness, tip and torque of each tooth.[3]

These constants were referred to as the “six keys to normal occlusion”.

Physiologic space: The other spaces in primary dentition are called developmental spaces, which are also known as physiological spaces and is present in between all the primary teeth and play an important role in normal development of the permanent dentition. The total space may vary from 0 to 8 mm with the average 4 mm in the maxillary arch and 1 to 7 mm with the average of 3 mm in the mandibular arch. All these spaces are important for the normal development of the permanent dentition.[5]

Primate spaces: they are also known as anthropoid or simian spaces. They are the most common space present in primary dentition, which are mesial to the primary canine in the maxilla and distal to the primary canine in the mandible. These are characteristics of primary dentition.[5] There are limited numbers of studies pertaining to occlusion in preschool children and the contradictory findings concerning age changes in deciduous molar relation, a further investigation seemed appropriate. therefore, the present study made an attempt to obtain the baseline information regarding the spacing of the primary dentition in preschool children (3-5 years) and to assess the age changes in molar relations.

MATERIALS AND METHODS

STUDY POPULATION

The present study was conducted by the Department of Pedodontics and Preventive dentistry, Maharaja Ganga Singh Dental College, Sriganganagar, Rajasthan. The study was based on examination of the primary dentition of 600 preschool children aged 3-5 years old from Sriganganagar, India. The sample was selected from nursery schools using a stratified random sampling technique and the age of each child obtained from school records.

Healthy preschool children irrespective of socioeconomic status whose age was between 3-5 years were included in the study.

INCLUSION CRITERIA

a. Children with complete set of primary dentition.
b. Age of children should be between 3 to 5 yrs.

EXCLUSION CRITERIA

a. Children with missing teeth due to any reason.
b. Children with dental deformities like cleft lip and palate, ankylosis of mandible, gemination, fusion, hypodontia and hypoplasia.

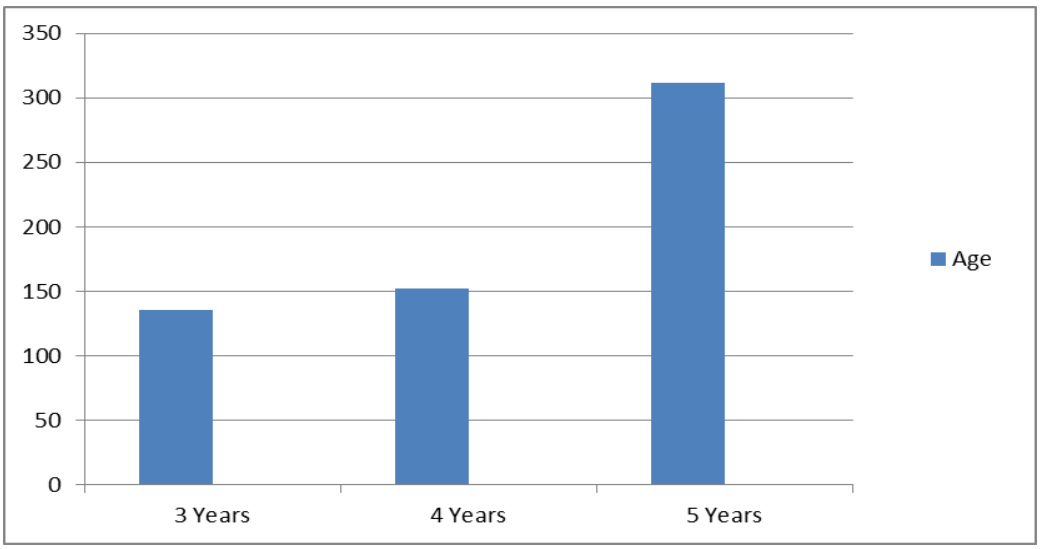
STATISTICAL ANALYSIS: The obtained data was subjected to the statistical analysis using SPSS medium.

RESULTS

The objective of the study was to evaluate the SPACING in the primary dentition. A total of 600 children who met the selection criteria were examined. Age distribution of sample is depicted in Table 1 and Graph 1. In this sample size, 136 were of 3 year of age, 152 children were 4 year of age and 321 children were of 5 year of age respectively.

Table – 1: Age distribution of sample study.

Age (years)	Number of children (N)	Percentage (%)
3	136	22.7
4	152	25.3
5	312	52.0
Total	600	100.0



Graph– 1: Age distribution of sample study.

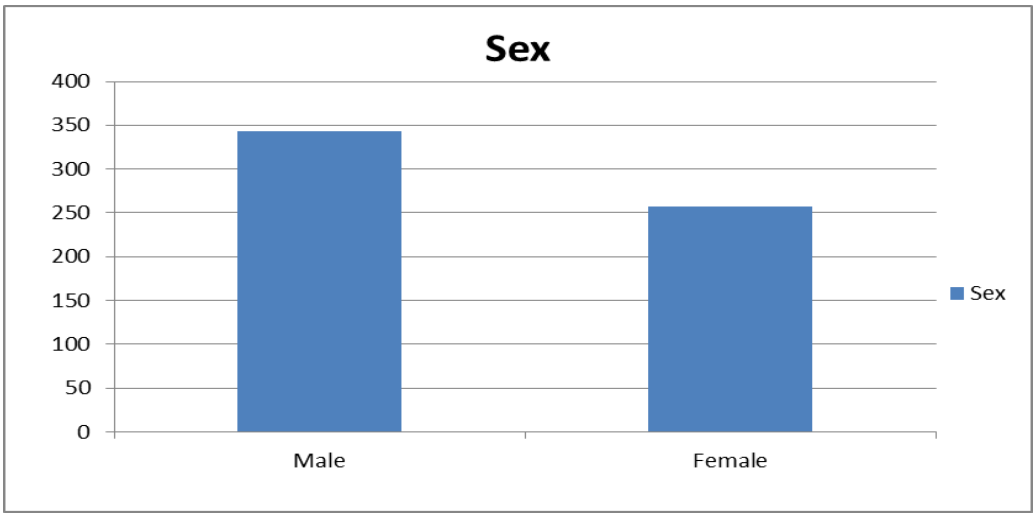


Table 2 and Graph 2. Shows sex distribution of the sample, that is out of 600 selected children, 343 children were males and 257 children were females.

Table – 2: Sex distribution of sample study.

Sex	Number of children (N)	Percentage (%)
1 (male)	343	57.2
2 (female)	257	42.8
Total	600	100.0

Table 3 and Graph 3 shows agewise percentage distribution of physiologic spacing. From this table, it is evident that in three year age group 55 (40.4%) were having physiologic spacing whereas 81 (59.6%) were devoid of physiological spacing. In four year old children 87 (57.2%) were having physiologic spacing and 65 (42.8%) were not having physiologic spacing. In the group of five year children physiologic spacing were present in 194 (62.2%) and absent in 118 (37.8%) children. Age wise distribution of physiologic spacing was statiscally highly significant (p= .000).

Table-3: Age wise distribution of physiological spacing.

Age (years)		Physiological spacing		Total
		Present	Absent	
3	Count	55	81	136
	% within age	40.4%	59.6%	100.0%
4	Count	87	65	152
	% within age	57.2%	42.8%	100.0%
5	Count	194	118	312
	% within age	62.2%	37.8%	100.0%

Statistically highly significant - p=.000

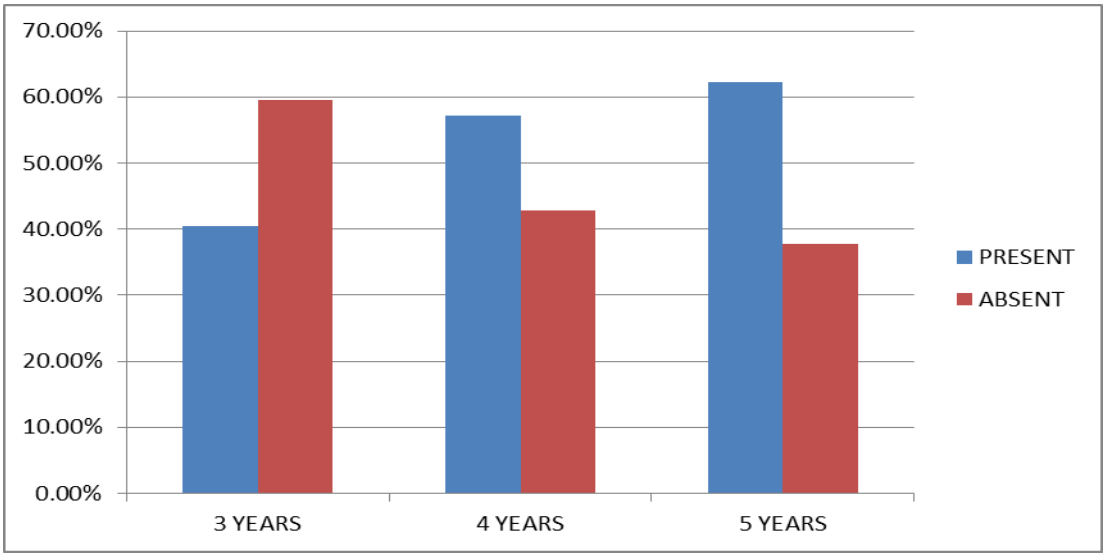


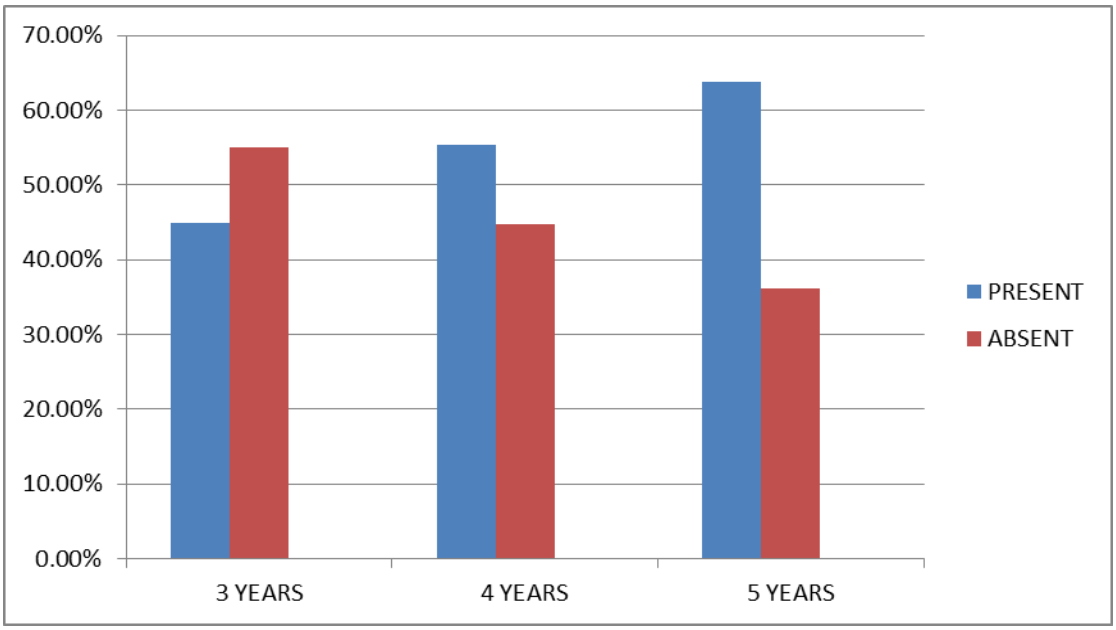
Table 4 depicts the percentage distribution of primate space. Primate spacing was seen in 344(57.3%) whereas 256 (42.7%) children were devoid of primate spacing.

Table-4: Primate spacing.

Primate spacing	Number of children (N)	Percentage (%)
Present	344	57.3
Absent	256	42.7
Total	600	100.0

Table 5, Graph 5 illustrates age wise percentage distribution of primate space. In the group of three year old children 61 (44.9%) were having primate space and 75 (55.1%) were not having primate spacing. In the four

year age group primate spacing were present in 84 (55.3%) and absent in 68 (44.7%) children. In the group of five year old children, primate spacing were present in 199 (63.8%) and absent in 113 (36.2%) children. The agewise distribution of primate spacing were statistically highly significant(p= .001).



Graph-5: Agewise Distribution of Primate Spacing.

Table-5: Agewise distribution of primate spacing.

Age (years)		Primate space		Total
		Present	Absent	
3	Count	61	75	136
	% within age	44.9%	55.1%	100.0%
4	Count	84	68	152
	% within age	55.3%	44.7%	100.0%
5	Count	199	113	312
	% within age	63.8%	36.2%	100.0%

Statistically highly significant - p=.001

DISCUSSION

Childhood is the mirror that reflects the propensity of adulthood. An ideal primary dentition likewise is an indicator of potentially perfect permanent dentition, function of the primary dentition includes maintenance of the occlusion and space for the permanent dentition in addition to mastication.[41]

Early recognition of conditions predisposing young children to malocclusions is in the hands of primary care providers who for practical purposes are general practitioners and the pediatric dentist. It is important that conditions that predispose one to develop a malocclusion of the permanent dentition, be detected early in the primary dentition.[55]

Many studies have been done in different parts of the world in order to determine variations in occlusion. The understanding of anterior and posterior changes that occur in occlusion between primary and permanent dentition is crucial for the clinician involved in planning early interceptive treatment.[28,19,56,11] **The lack of such statistical data of the Indian population in Sri Ganganagar prompted us to undertake this study.**

Physiological spacing are developmental spaces in primary dentition which play a significant role in the alignment of erupting permanent teeth and the establishment of occlusion. Absence of these spaces may be an expression of disproportion between the jaw and tooth size. In our study on physiologic spacing examination, it was found that 56% children were present with spacing and 44% children were lacking physiological spacing **which is comparatabily lower prevalence than that reported by other studies, including one on Jordanian in which** generalized spacing was found in 61·8% and 61·1% of children in the upper and lower arches, respectively[34] **and South Indian children where** the mean values of spaced dentition were higher in both group that is Chennai

(74.1%) and Hyderabad (73.6%) whereas non-spaced dentition were 26.4% and 25.9% respectively[41], Shobha et al where 56.7% of sample size were having physiologic spaces.[58] **and more prevalence that of kisling et al study where** total spacing existed in 34.5 % of the maxillary and 24.3% of the mandibular arches.[13] In present study, physiologic spacing were present in 40.4% in three year of age group children, 57.2% in four year old children while 62.2% in five year old children (Table 17). In this present study there was increase in spacing with advanced age which correlates with the study done by **Sapna Hegde et al.[39] Another study conducted by Joshi e al among children in Gujarat in which they also concluded that spaced dentition were in majority compared to non-spaced dentition.[17] In the present study** age wise distribution of physiologic spacing was statiscally highly significant (p= .000).

Primate spaces

Like physiologic spacing, primate spacing are also naturally occurring spacing which are located between the deciduous lateral incisors and deciduous canine in upper arch and between deciduous canine and deciduous first molar in lower arch. In present study primate spacing was observed in 57.3% whereas 42.7% children were devoid of primate spacing which was parallel to study done by Maryam et al which concluded that the mean of primate space was 1.7±0.61mm in the maxilla and 1.2±0.45 mm in the mandible. Primate space was seen in both sides of the arch in 80.2% of subjects.[43] D.J. Boyko et al has shown that in 26% of sample size minimal amount of spacing about the arch while in 26% there was spacing about each tooth in each arch and the remaining cases accounted for 42 per cent of the spacing.[8] These findings are not in agreement with the study which was carried by O. D. Otuyemi et al with respect to anthropoid spaces, in which 8.4% and 12.8% were found to have anthropoid spaces only in maxilla and mandible respectively.[26] **In present study,** age wise percentage distribution of primate space in three year old children were 44.9%, 55.3% in four year old and 63.8% in five year old children (Table 5). The absence of spacing, though less common, is not a sign of abnormality in the deciduous dentition. In this study, the frequency of dental arches with absence of spacing was 55.1% in three year old children, 44.7% in four year old and 36.2% in five year old children. Similar to physiologic spacing, primate spaces were also noted to increased as age advances which correlates with the study done by **Sapna Hegde et al[39] and study done by** Evandro Eloy Marcone Ferreira in which Japanese Brazilians, generalized spacing was the most prevalent characteristic in the maxillary (46.2%) and mandibular (53.3%) arches[59] **but contradict the study conducted by the** Carvalho KL et al in which they concluded significantly reduced frequency of primate spaces at the age range from 4 to 6 years ($p<0.05$), in comparison to the group of children aged 2 to incomplete 4 years. In present study age wise percentage distribution was highly significant.

CONCLUSION

The aim of our paper was to examine the spacing in primary dentition in pre school age group of 3 to 6 years selected from various schools of sriganganagar rajesthan. we concluded that physiologic spacing as well as primate spaces were noted to increased as age advances and as variation of primary dentition can show effect on permanent dentition. however its essential that more future studies be carried on the spacing in primary dentition to substantiate the results.

REFERENCES

1. Ash MM and Ramfjord SP (1982). Occlusion, 3rd edn. Philadelphia: W.B. Saunders Co.
2. Angle EH (1899). Classification of malocclusion. Dental Cosmos, 4: 248-264.
3. Andrews LF (1972). The six keys to normal occlusion. Am J Orthod Dentofacial Orthop, 62(3): 296-309.
4. Farsi NM, Salama FS. Characteristics of primary dentition occlusion in a group of Saudi children. Intr Jr. Ped. Dent., 1996; 6(4): 253-259.
5. Tondon S. Textbook of pedodontics, 2nd edition. India: Paras Medical, 2009: 109.
6. Sriram CH, Priya VK, Sivakumar N, Reddy KR, Babu PJ, Reddy P. Occlusion of primary dentition in preschool children of Chennai and Hyderabad: A comparative study. Contemp Clin Dent., 2012; 3(1): 31-7.
7. Malandris M, Mahoney EK. Aetiology, diagnosis and treatment of posterior crossbites in the primary dentition. Int J Pediatr Dent., 2004; 14(3): 155-166.
8. Alexander S, Prabhu NT. Profiles, occlusal plane relationships and spacing of teeth in the dentitions of 3 to 4 year old children. J Clin Pediatr Dent., 1998; 22(4): 329-34.
9. Bishara SE, Hoppens BJ, Jakobsen JR, Kohout FJ Changes in the molar relationship between the deciduous and permanent dentitions: a longitudinal study. Am J Orthod Dentofacial Orthop., 1988; 93(1): 19-28.
10. Foster TD, Grundy MC. Occlusal changes from primary to permanent dentitions. Br J Orthod., 1986; 13(4): 187-93.
11. Arya BS, Savara BS, Thomas DR. Prediction of first molar occlusion 1973, Am J. Orthod, 63(6): 610-621.
12. Abu Alhaija ES, Qudeimat MA. Occlusion and tooth/arch dimensions in the primary dentition of preschool Jordanian children. Int J Paediatr Dent., 2003; 13(4): 230-9.
13. Fernandes S, Patel DG, Ranadheer E, Kalgudi J, Santoki J, Chaudhary S. Occlusal Traits of Primary Dentition among Pre-school children of, Mehsana district, North Gujarat, India. Journal of Clinical and diagnostic Research, 2017; 11(1): ZC92-ZC96.
14. Kisling E, Krebs G. Patterns of occlusion in 3-year-old Danish children. Community Dent Oral Epidemiol., 1976; 4(4): 152-9.

15. Sapna Hegde, Sunil Panwar, Dinesh Rao Bolar, Mitesh Bharat Sanghavi. characteristics of occlusion in primary dentition of preschool children of Udaipur, India. Eur J Dent., 2012; 6(1): 51-5.
16. Joshi MR, Makhija PG. Some observations on spacing in the normal deciduous dentition of 100 Indian children from Gujarat. Br J Orthod., 1984; 11(2): 75-9.
17. Talebi M, Ajami B, Sahebalam R. Evaluation of the Occlusion and Arch Dimensions in the Primary Dentition of an Iranian Population. J Dent Mater Tech., 2013; 2(1): 11-6.
18. Boyko DJ. The incidence of primate spaces in fifty 3 year old children of the Burlington study. 1968. Am J Orthod, 54(6): 462-465.
19. Otuyemi OD, Sote EO, Isiekwe MC, Jones SP. Occlusal relationships and spacing or crowding of teeth in the dentitions of 3-4-year-old Nigerian children. Int J Paediatr Dent., 1997; 7(3): 155-60.
20. Ferreira EEM, Pastori EC, Ferreira RI, Scavone Junior H, Valle-Corotti KM. Comparative assessment of anterior spacing in Japanese Brazilian and Caucasian children in the deciduous dentition. Dental Press J Orthod., 2011 Sept-Oct; 16(5): 155-62.