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An Epidemiologic Study of Gender Differences in Dental Space Anomalies

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ABSTRACT

Dental anomalies may be expressed with different degrees of severity. Most malocclusions are inherited genetically, although some can be caused by accidents, early or late loss of baby teeth, or prolonged thumb sucking and are of three types viz. dentiional anomalies, occlusion anomalies and Space anomalies. In this cross-sectional study, we evaluated the prevalence of space anomalies in the permanent dentition. Total 1000, completely healthy male and female subjects between 14-16 years of age were selected randomly for the study. This was Primary Data collected from different educational campuses in Pune, Maharashtra. Descriptive statistics was done by calculating the Standard error of difference between two proportions. Comparison of outcome parameters was calculated with significance test ('p' value). Spacing were more commonly seen in males whereas crowding was more commonly seen in females in maxillary region than the mandibular region. The difference being statistically significant (P<0.05). The study concludes that spacing and crowding are much prevalent in males and females respectively, with the predominant involvement of maxillary region than the mandible.
Keywords: Malocclusions; Space anomalies; Crowding; Maxillary.

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INTRODUCTION

Dental anomalies are craniofacial of form, function or position of teeth, bones & tissues of the jaw and mouth [1].The development of teeth occurs both before and after birth. The catastrophic changes associated with parturition causes various disturbances of several days duration which are clinically evidenced by loss of weight and arresting of general growth. These produces disturbance in odontogenesis [2, 3]. Dental anomalies may be expressed with different degrees of severity. From the mildest to the most severe manifestation, represented respectively by the developmental delay and by the tooth agenesis, there is a myriad of expressions, including microdontia, changes in dental morphology and ectopias [4].

Malocclusion, meaning bad or misaligned bite, is caused by crowding teeth, extra teeth, missing teeth, or jaws that are out of alignment. Most malocclusions are inherited genetically, although some can be caused by accidents, early or late loss of baby teeth, or prolonged thumb sucking [1]. Malocclusion is classified into three main groups -1) Dentitional anomalies - anomalies restricted to individual teeth 2) Occlusion anomalies - anomalies in the positional relationship between the dental arches, and 3) Space anomalies [5,6] .The recognition of malocclusion is an important problem in Public dental health services for children implies a need for rational Planning of preventive and therapeutic orthodontic measures. With the same indication, the present study was planned out where we assessed the prevalence of space anomalies in the permanent dentition among a group of males and females of age group of 14-16 years. The occurrence was evaluated in relation to gender, the location and pattern of distribution in the maxillary and mandibular arches.

MATERIAL AND METHODS

Present study was done in three different educational campuses in Pune City. These areas were selected randomly. Subjects were exam in edrandomly and permission from the authority of each institute were taken through proper channel.

Inclusion Criteria

Total 1000(500 boys and 500 girls), between 14 to 16 years of age, in whom permanent teeth except third molar tooth be fully erupted and had not undergone orthodontic appliance therapy, irrespective of simultaneous extractions were selected for dental examination. After obtaining consent and giving a prior briefing about the study and its importance, printed data collection forms were distributed. Then personal and family history were recorded. The boys and girls were examined in the health camps, and their respective classes and premises of the college. The subjects were asked to fill the history. Birth dates given by the students were confirmed by checking the school records. The age was calculated in years and months.

Extra Oral Examination

In extra oral examination symmetry of face was noted and the temporo-mandibular joint was examined for deviation, discomfort and opening of mouth.

Intra Oral Examination:

Soft tissue

The condition of oral mucosa is good indicator of general health. Examination of mucosa of palate, tongue and cheeks for inflammation, any swelling, white or red patches, ulcersetc. was done.

Periodontal tissue

Examination of periodontal pocketing, oralh ygiene, tooth mobility was done.

Teeth

The teeth present were counted and recorded in full dental charting. The supernumerary or missing teeth were looked for. If any missing or supernumerary tooth was found it location was noted. After counting teeth, oral cavity was observed crowded teeth and their location was noted. Oral cavity was searched for the spacing of teeth, and if present, it was noted whether they were in upper or lower arch. The size and shape of the crown of teeth were inspected. Tooth size was diagnosed as anomalous when the norms for the sex and racial group concerned were exceeded. The teeth were inspected for discoloration, after taking the history and grouped under intrinsic/extrinsic discoloration. A tooth identified rotation, if it twisted around its long axis.

Occlusion

Inspecting the distance between the upper and lower incisors in the horizontal plane identified the over jet. The Maxillary or mandibular over jet and distal mesial molar Occlusions were looked for. The overbite was identified inspecting vertical overlap of the Upper and lower incisors when viewed anteriorly, The overbite Which was greater than one half was described as being Increased, and was noted as overbite, The over bite which was Less than one third, was described as being reduced. Open bite was identified by space vertically between the incisors when the buccal segment teeth were in occlusion. Cross bite was identified by buccal cusps of the lower premolars and/or molars occluded buccal cusp of the upper premolars and/or molars. Scissor bite were identified by buccal cusps of the lower Premolars and/or molars occluded lingually to the lingual cusps of the upper premolars or molars [5, 7].

OBSERVATION AND RESULTS

TableNo.1–Frequenciesofspaceanomalies

A)   Spacing of teeth in male subjects.

	Anterior Segment	Posterior Segment	Total	Percent	Standard Error
Maxilla	36	15	51	10.2	1.35
Mandible	24	08	32	06.4	1.09

B)   Spacing of teeth in female subjects.

	Anterior Segment	Posterior Segment	Total	Percent	Standard Error
Maxilla	18	08	26	5.2	0.99
Mandible	09	05	14	2.8	0.73

C)   Differences of Spacing of teeth in male and female subjects.

	Male		Female		Sex Difference 'p' value
	N	Percent	N	Percent	
Maxilla	51	10.2	26	5.2	P<0.05
Mandible	32	6.4	14	2.8	P<0.05
Total	84	16.6	40	6.0	P<0.05 Significant

Table No 2–FrequenciesofCrowdingofteeth

A) Crowding of teeth in male subjects.

	Anterior Segment	Posterior Segment	Total	Percent	Standard Error
Maxilla	32	16	48	9.6	1.31
Mandible	22	17	39	7.8	1.19

B) Crowding of teeth in female subjects.

	Anterior Segment	Posterior Segment	Total	Percent	Standard Error
Maxilla	52	20	72	14.4	0.41
Mandible	32	17	49	9.8	1.76

C) Differences of Crowding of teeth in male and female subjects.

	Male		Female		Sex Difference 'p' value
	N	Percent	N	Percent	
Maxilla	48	9.6	72	14.4	P<0.05 Significant
Mandible	39	7.8	49	9.8	P>0.05 Not Significant
Total	87	17.4	128	24.2	P<0.05 Significant

Spacing

In male subjects crowding was more commonly seen in anterior segment than posterior segment and more commonly seen on maxilla than mandible.

In female subjects crowding was more commonly seen in anterior segment than posterior segment and more commonly seen on maxilla than mandible.

In male and female subjects crowding was more commonly seen in anterior segment than posterior segment and more commonly seen on maxilla than mandible.

Crowding

In male subjects crowding was more commonly seen in anterior segment than posterior segment and more commonly seen on maxilla than mandible.
In female subjects crowding was more commonly seen in anterior segment than posterior segment and more commonly seen on maxilla than mandible.

In male and female subjects crowding was more commonly seen in anterior segment than posterior segment and more commonly seen on maxilla than mandible.

DISCUSSION

Frequencies of Space anomalies

Spacing

Generalized spacing is rare and is due to hypodontia or small teeth in well-developed arches. An association between small teeth and hypodontia has been demonstrated. Localized spacing may bedue to hypodonita or loss of tooth as a result of trauma, or because extraction was indicated because of displacement, morphology and pathology. This problem is more noticeable if an upper incisor is missing as the symmetry of the smile is affected, an upper incisor is noticed more by the lay public than other aspects of malocclusion [8,9].

In the present study as shown in table 1(B) the frequency of the spacing in female subjects was more commonly seen in maxilla (5.2%) than mandible (2.8%).

As shown in table no.1(C),male showed higher number frequency of spacing (16.6%)than females (6%). This difference is statistically significant. Goose D.H. Thompson D.G. and Winter FC observed malocclusion in school children of the West midlands. They showed anomalies of space condition in the maxilla. The boys showed consistently less crowding and more spacing than the girls [10].

This study also noticed that space anomalies or often combine with Angles class I malocclusion. Fogorv SZ. studied the orthodontic treatment in adolescents. Spacing in the upper segment was observed in 10.4%,while spacing in the lower segment was seen 2.9% [11]. Thilander B, Penal, Infant C. studied the prevalence of malocclusion and orthodontic treatment need in children and adolescents. Clear sex difference was noted in spacing. The spacing was more frequent in males [12]. A study done by Helm in Danish children, noticed that spacing in maxilla was present in 8.7%males, and 4.6% females. This had statistically significant sex difference. Spacing was found mandible of 5.5% males and 2.7%females, the sex difference being statistically significant. These results are similar to the above results [13].

Crowding

Crowding occurs where there is discrepancy between the size of the teeth and the size of the arches. In the above study, as shown in table no. 2(A) crowding of teeth in male subjects were more on anterior segment than posterior segment and more in maxilla (9.6%)than mandible (7.8%). In female subjects frequency of crowding was more in maxilla (14.4%) than mandible (9.8%). Also frequency was more in anterior segment than posterior segment. The sex difference was statistically significant. Females had more crowded teeth than males. Goose D. H. Thompson D. G. and Winter FC observed malocclusion in school children of West midlands. They showed anomalies in space conditions in the maxilla, the boys showed consistently less crowding and more spacing than the girls [10].

Fogorv SZ studied the orthodontic treatment in adolescents. He noticed crowding of teeth in 40.3% subjects. A study done by Helm noticed that in male maxilla (19.4%) crowding was present which was less than female maxilla (24.5%). The sex difference was statistically significant [11]. Magnusson TE. Studied prevalence of space anomalies with regard to the various stages of dental development in Icelandic schoolchildren. In most of the frequencies of the different space anomalies boys showed a higher prevalence than girls [14].

By early detection of dental space anomalies, alternative treatment modalities can be planned and performed with a multidisciplinary team approach in order to establish an aesthetic and functional dentition in the future and to minimize the complications of hypodontia.

CONCLUSION

The prevalence of dental space anomalies in male and female subjects was relatively similar, but Spacing of maxilla was observed more prevalent in male subjects than females whereas crowding of maxilla was observed more prevalent in female subjects than male subjects. The study concludes that dental spacing and crowding are much prevalent in males and females respectively, with the predominant involvement of maxillary region than the mandible.

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