Original Article

Indian Journal of Dental Education
Volume 8 Number 4, October - December 2015
https://dx.doi.org/10.21088/ijde.0974.6099.8415.2

Prevalence of Cross Bite Occlusion in Bilaspur, Chhattisgarh

Thilagarani P.R.*, D. Ashok Kumar, Yogesh Mahobia***, Anurag Tiwari****, Vidyesh D. Nadkerny****, Mrigank Shekhar Jha*****

Abstract

Cross bite is one of the common occlusal anomaly in orthodontic population. It may be present in anterior or posterior region and it can be of dental or skeletal in origin. There have been many studies carried out in different parts of world to find the prevalence of cross bite. This study was carried out in Bilaspur, Chhattisgarh population to access the cross bite prevalence so that appropriate dental health services could be planned. This examination was carried out on 468 subjects out of which 183 were male and 285 were female. Patient's pre treatment cast was used and was clinically examined. This analysis showed that total percentage of cross bite recorded was 19.01%. The posterior cross bite percentage is 11.32% and while that of anterior is 7.69%. The percentage of cross bite in female is 10.47 % and male is 8.54 %. The percentage of bilateral cross bite is 1.28% and unilateral percentage is 10.04%. Cross bite was more prevalent in females as compared to males. Posterior cross bite was more common than anterior cross bite. Cross bite were not reported in class II div II and class III cases.

Keywords: Cross Bite; Occlusion; Unilateral; Bilateral; Anterior; Posterior; Prevalence; Bilaspur.

Introduction

The prevalence of malocclusion in any location is an important determinant in planning of effective orthodontic services. The high prevalence of malocclusions implies that public health efforts are required as such conditions affect negatively the individual's quality of life, particularly in the case of children and adolescents, who are sensitive about their appearance. Orthodontic care in bilaspur area is still rare due to high treatment cost and the lack of specific public assistance policies. Cross bite is one of important anomalies of teeth and it has been seen that it is very common in bilaspur. The epidemiological data on the prevalence of cross bite may help in controlling this malocclusion. A crossbite is defined as an abnormal labiolingual or buccolingual relationship between maxillary and mandibular teeth when the teeth of both arches are in occlusion.

According to the Malcolm L. Jones and Richard Goliver etiological factors of cross–bite may attribute to the following.

1. Skeletal Origin: The maxilla is narrow in relation to the mandible and this reflected in the arch widths.

2. Soft tissue factor: If swallowing habitually takes place without occlusion of teeth, pressure from cheeks may equalize the widths of the arches. Similarly, with habits such as persistent digit sucking,. Forces from cheeks whilst the teeth are not in occlusion may narrow the maxillary arch, so that unilateral cross bite with mandibular displacement occurs.

3. Pathological factor for example unilateral cleft palate, unilateral condylar Hyperplasia [1].

The presence of anterior crossbites may cause mandibular displacement, if left untreated may lead to restriction of maxillary growth, traumatic occlusion, and may lengthen the treatment time [2]. The present study was conducted with the aim of calculating the prevalence of cross bite in Bilaspur population. The frequency and pattern of cross bite was also determined in the same orthodontic population.

Author's Affiliation: *Professor and Head **Reader ***Senior Lecturer ****P.G. Student, Department of Orthodontics, Newhorizon Dental College and Research Institute, Bilaspur, Chhattisgarh. *****P. G. Student, A Department of Orthodontics, Department of Orthodontics, Buddha Institute of Dental Sciences and Hospital, Patna.

Reprints Requests: Anurag Tiwari, P.G. Student, Department of Orthodontics, Newhorizon Dental College and Research Institute, Sakri, Bilaspur, Chhattisgarh- 495001.

E-mail: dranuragtiwari@gmail.com

Methodology

In this retrospective study 468 patient's model cast were randomly examined.Dental cast were collected from Department of Orthodontics and Dentofacial Orthopedics and Department of Pedodontics of New Horizon dental college sakri bilaspur. All subjects were examined. Both anterior and posterior cross bite and molar relationship according to angle's classification recorded.

Posterior cross bite was evaluated assessing transversal relationship of the upper and lower premolars and molars. The normal transversal relationship was considered when the tips of the buccal cusps of the lower teeth occlude with the central fossae of the opposing upper premolars and molars. The cross bite was considered when the tips of the buccal cusps of one or more upper molar or premolar occlude in the central fossae of the lower molars or premolars, either buccal aspects of buccal cusps of the upper molars or premolars contact with lingual aspects of buccal cusps of appropriate lower teeth.

Anterior cross bite cross bite was evaluated assessing saggital relationship of the upper and lower anterior teeth, the normal relationship was considered when the lower incisor edge occlude with the platea of cingulum of upper incisor. The cross bite was considered when there is opposite relationship found.

Inclusion Criteria

- No extensive carious lesions, missing teeth, dental anomalies of shape, number, structure, and eruption.
- No history of orthodontic treatment, traumatic injuries to the craniofacial complex, or oral surgeries.

Exclusion Criteria

- Extensive carious lesions, missing teeth, dental anomalies of shape, number, structure, and eruption.
- History of orthodontic treatment, traumatic injuries to the craniofacial complex, or oral surgeries. These criteria were used to exclude changes in occlusal relationships that could interfere with our result.

Result

468 patients were observed from the Department of Orthodontics & Dentofacial Orthopaedics, Bilaspur, Chhattisgarh and among them 89 (19.01%) patients were diagnosed as cross bite of either type(Table 1). Anterior cross bite was reported in 36 (7.69%) patients, posterior cross bite was reported in 53 (11.32%) patients (Table 1). Prevalence of cross bite is more in females (10.47%) then male patients(8.54%) (Table 5).Percentage distribution for crossbite showed anterior cross bite percentage is 40.44% while posterior crossbite percentage is 59.54%(Table 4). Female patient's cast showed prevalence of anterior crossbite(21.34%) and 29.21% of unilateral posterior crossbite respectively(Table 4). Male patient's cast showed 19.10% of anterior crossbite and 23.59% of unilateral posterior crossbite respectively(Table 4).No crossbite were reported in Angle's class II Div II malocclusion and Angle's Class III malocclusion cases.(Table 3).

Table 1: Prevalence of cross bite in bilaspur population

Total	Cross bite		89		
	An terior		Posterior Unilateral		Bilateral
468	right	Left	right	left	6
19.01%	17	19	12	29	
	36		47		
	7.69%		10.04%		1.28%

Table 2: Distribution of male & female sample

Total	Male	Female
468	183	285

Table 3: Percentage distribution of cross bite among various mal-occlusions

Total case	Class I	Class II		Clas SIII
468	65	Class II divi 1	Class II divi 2	-
		24	-	

Table 4: Percentage distribution of cross bite among male & female

89 Total			Boys		Girls	
	N	%	N	%	N	%
Anterior cross bite	36	40.44%	17	19.10%	19	21.34%
Unilateral Posterior cross bite	47	52.80%	21	23.59%	26	29.21%
Bilateral Posterior cross bite	6	6.74%	2	2.24%	4	4.4%

Table 5: Prevelance of crossbite % among male & female

Total sample size	Male	Female
468	40	49
%	8.54%	10.47%

Discussion

The present study was carried out to evaluate the prevalence of crossbite in Bilaspur population between age group 9-22 years.This study showed prevalence of total cross bite was 19.01%. In this study prevalence of crossbite was more in females(10.47%) than males (8.54%). This study showed both unilateral and bilateral type of crossbite. Tariq Salhi found in his study [1] 18.8% of cross bite in Iraqi student of Baghdad city. Helm [3] found similar findings, 9.4% of cross bite in males and 14% of cross bite for females in Danish children. Similarly Lavella [4] found cross bite in male is 13.6% and 23% of crossbite in female patient. Kutin and Hawes [5] found cross bite in male 8.8% and 7.8% for female. Foster and Day [6] found unilateral cross bite 9% while bilateral cross bite 4.1% Ingervall [7] found unilateral cross bite 13.6% and bilateral cross bite 5.3%. Al-Dailami [8] found unilateral cross bite 5.3% and bilateral cross bite 1%.O.O daCosta [9] found 29.9% of crosbite in Nigerian population where anterior cross bite was 66.1% and posterior cross bite was 19.6%. Ricardo Alves [10] found 5.7% of anterior crossbite and 8.4% of posterior crossbite in Brazilian population. R. Muppa [12] found 5% of cross bite in south Indian population and found 4.98% of posterior cross bite. H. Kaur [12] found 8.48% in anterior cross bite and 0.99% in posterior cross bite. E.R. Reddy [13] found 4.5% of anterior cross bite and 3.75% of posterior cross bite. Dental asymmetry rather than skeletal asymmetry is the primary contributor to posterior cross bite. Untreated anterior and posterior cross bites have been found to be significantly related to the occurrence of temporomandibular joint disorder. Over retained deciduous molar is one of the reason for cross bite.Genetic factors or racial factors can be one of the reasons for more prevalence of cross bite in females as compared to males.Day and foster [16] have shown that unilateral cross bite is significantly associated with class III, skeletal relationship. Wood [17] reported the propable etiologigal factors for cross bite which include prolonged retention of decidous teeth, crowding, premature loss of decidous teeth, palatal cleft, lingual position of tooth bud.

Conclusion

Cross bite was more prevalent among females as compared to males.Smilarly posterior cross bite was more prevalent as compared to anterior crossbite. All cross bite which were reported were of dental in origin. Unilateral cross bite was more prevalent than bilateral cross bite. Moreover,no cross bite were reported in Angle's Class II Div II and Angle's Class III malocclusion category.

Further studies are required to specify various etiological factors which may cause cross bite. It will help in increasing the decision making ability of clinician as well as formation of necessary preventive measures for treatment of cross bite in an Orthodontic population.

Acknowledgement

I am extremely thankful to the Department of Pedodontics of New Horizon Dental College, Bilaspur, Chhattisgarh for their immense help and support for completion of this study as the patients were taken from Department of Pedodontics. I am gratefull to my Staff, collegeues without their support this study would not have been possible.

References

1. Tariq Shalhi Alijjourane:Distribution of cross bite in a sample of Iraqi student in Baghdad city MDJ. 2009; 6(2): 134-39.
2. Chung Wai Mok:Self correction of anterior cross bite:a case report.Cases journal. 2009; 2: 69679(1-3).
3. Helm.S:Malocclussion in Danish children epidemiologic study.American Journal of Orthodontics & Dentofacial Orthopaedics. 1968; 54(5): 352-66.
4. Lavelle C.L.B:A study of multiracial and occlusion community. Dent. Epiolemiol. 1976; 4: 38-41.
5. Kutin G:Posterior cross bite in the deciduous and

mixed dentitions.American Journal of Orthodontics & Dentofacial Orthopaedics. 1969; 55(3): 242-250.

6. Foster T.D,Day A.J.W:A survey of malocclusion and the need for orthodontic treatment in a shropshire school population.British Journal Of Orthodontics. 1974; (1): 73-78.
7. Ingervall B,Mohlin B,Thilander B:Prevalence and a wearness of malocclusion in swedish men. Community dent.oral.epidemiol. 1978; 6: 308-314.
8. Al-Dailami:Occlussal features in a sample of yemini student.M.Sc thesis of dentistry.Baghdad university: 2000.
9. O.O daCosta,I.L.Utomi:A clinical review of crossbite in an orthodontic population.West African journal of medicine. January- February, 2011; 30(1): 24-28.
10. Ricardo Alves de Souza,Maria Beatriz Borges de Araujo Magnani:Prevalence of malocclusion in a brazilian school children population and its relationship with early tooth loss. Brazilian journal of oral science. 2008: 7(25): 1566-1570.
11. R. Muppa,Bhupathi Raju P:Prevalence and determinant factors of malocclusion in population with special needs in South India.Journal of Indian society of Pedodontics and Preventive Dentistry. April-July 13, 2013; Vol 31(2): 87-90.
12. Kaur H,Pavithra VS:Prevalence of malocclusion among adolscents in South Indian population. Journal of International society of Preventive Dentistry. July-Dec 2013; 3(2): 97-102.
13. Kobayashi H.M,Ferreeira R.I:Relationship between breastfeeding duration and prevalence of posterior crossbite in the deciduous dentition.American Journal of Orthodontics & Dentofacial Orthopaedics. 2010: 137(1): 54-58.
14. Steven D.Marshall,Karrin.A Southard,Thomas E.Southard:Early transverse treatment.Seminars in Orthodontics, page-130-139.
15. Reddy E.R,Manjula M;Prevalence of cross bite among 6 to 10 year old Nalgonda school.Journal of International Oral Health Nov-Dec 2013; 5(6): 49-54.
16. Day A.J.W,Foster T.D:An investigation in to the prevalence of molar cross bite and some associated etiological conditions.Dent.Praitit. 1971; 21(11): 402-410.
17. Wood A.W.S:Anterior and posterior cross bite J.Dent.Children.1962; 29: 280-286.