Original Article

AN EVALUATION OF MALOCCLUSION IN RURAL AND URBAN SCHOOL CHILDREN OF DISTRICT PESHAWAR

Dila Baz Khan, Saqib Ali, Imdadullah

Khyber College of Dentistry, Peshawar

ABSTRACT

Objective: *The aim of this analytical cross-sectional study was to evaluate malocclusion in rural and urban school children of District Peshawar.*

Methodology: *Five hundred and twenty school children of both genders were randomly selected from Government High Schools of District Peshawar (urban and rural). The study participants were examined in their schools using wooden spatulas, calibrated probes and torch light. Angle's classification was used for recording various traits of malocclusion. Special proforma was used for recording the data. Data were analyzed using SPSS, V-20 and Chi-square test was applied.*

Results: *The difference in prevalence of malocclusion in rural and urban school children (60% and 55%) was insignificant. In rural area, the prevalence of malocclusion was 50.67% in boys and 72.73% in girls while in urban area, it was 44.20% and 67.21% respectively. This difference in prevalence of malocclusion in boys and girls in both areas was highly significant. The most common traits of malocclusion were Angle's class I and overcrowding.*

Conclusions: *Malocclusion is significantly more prevalent in girls than boys in both urban and rural areas of District Peshawar. Angle's class-I malocclusion and overcrowding are the most commonly occurring traits of malocclusion.*

Key words: *Rural, Urban, Malocclusion, Angle's Classification, Overcrowding.*

INTRODUCTION

Malocclusion is one of the most common dental problems after dental caries in children and young adults[1]. It is a term usually used to describe deviations in intramaxillary and / or intermaxillary relations of the teeth and / or jaw[2]. The term malocclusion is a derivative of occlusion which is the contact relationship between upper and lower teeth when the mouth is fully closed as well as the relationship of the teeth within the same jaw. It may be primary which arise in the developing dentition or secondary, which arise in the adult as a result of tooth loss and consequent adjacent tooth movement[3].

The prevalence of malocclusion varies from rural to urban areas in different populations and vice versa. An Indian study reported the prevalence of malocclusion to be higher in urban (20.8%) than rural (14.9%) and more prevalent in female school children (21.8%) than male (13.2%)[1]. Different results have been reported for Jammu and Kashmir where malocclusion was recorded to be more prevalent in rural area (62.3%) than urban (55.3%)[4].

Children having very severe or handicapping malocclusion need to be identified and corrective measures instituted at the earliest, to prevent a widespread impact on their psychological development[1]. Children with malocclusion are commonly shy, lack confidence, and cannot face unknown people. The objective of this study is to evaluate malocclusion in rural and urban school children of District Peshawar.

METHODS AND MATERIALS

This analytical cross sectional study was carried out in district Peshawar of Khyber Pakhtunkhwa from July 2012 to September 2012. Study population included school children from rural and urban areas of District Peshawar with age range 12-16 years. Twenty High schools (Male/Female) were randomly selected from a total of 97 high schools (male and female) of

Correspondence:
Dr. Dila Baz Khan
Associate Professor
Department of Oral Biology
Khyber College of Dentistry, Peshawar
Cell: 0300-5964891
Email address: drdilabaz@hotmail.com

District Peshawar with 10 each from urban and rural areas.

Stratified random sampling technique was used for sample selection. The sample size was 520 school children, 260 each from rural and urban areas. Out of 260 rural school children, 150 were boys and 110 were girls while school children from urban areas (260) included 138 boys and 122 girls. Sample size was calculated using WHO software for sample size determination at 95% confidence interval. Children having developmental defects, orthodonticaly treated and foreigners were excluded from the study. After taking informed consent and approval from ethical committee of Sardar Begum Dental College, school children were examined in ordinary chair using torch light, wooden disposable spatula, tooth measuring gauge and periodontal probe. Malocclusion was diagnosed purely on clinical examination irrespective of the fact whether it was dental, skeletal, neuromuscular or of soft tissue origin. No radiographs or study models were taken. Data were collected using specially designed proforma.

Angle's classification was used for recording various traits of mal occlusion. Over jet was measured with periodontal pocket measuring calibrated probe. It was dichotomized, considered increased when the horizontal distance between upper and lower incisors was greater than 3 mm or normal. The normal value of overbite is 1 to 3 mm but it changes with the length of incisors. The overbite was dichotomized, considered increased where the mandibular incisors were not visible when the mouth was closed in normal occlusion and was considered normal when cervical 2/3 or 1/3 of mandibular incisors were visible. Open bite was recorded when there was space in between upper and lower teeth when the mouth was closed in centric occlusion. Cross bite was recorded when there was an abnormal labiolingual or buccolingual relationship of the upper and lower teeth when the mouth was closed in normal occlusal position. Crowding was recorded when there was overlapping of two or more teeth or at least 2mm space deficiency in each quadrant. Spacing was recorded when diastemas was present between two adjacent teeth or excess space of at least 2mm was present in each quadrant.

RESULTS

Prevalence of malocclusion in rural and urban areas: The total sample size was 520 school children, out of which 260 were from rural area and 260 were from urban area school children. The difference in prevalence of malocclusion in rural and urban school children (60% vs 55%) was non-significant (Table-1).

Gender wise distribution of malocclusion in rural and urban areas: In rural area, the prevalence of malocclusion was 50.67% in Boys and 72.73% in Girls, while in urban area it was 44.20% in Boys and 67.21% in Girls. The difference in prevalence of malocclusion in boys and girls in both areas (rural and urban) was highly significant (Table-2 & 3).

Prevalence of malocclusion according to Angle's classification: In rural area, the prevalence of Angle's Class-I, II and III malocclusion was 110(70.51%), 40(25.64%) and 6 (3.85%) respectively while in urban area, the values were 78 (54.55%), 56 (39.16%), and 9(6.29%). (Table-4)

Table-1: Prevalence of malocclusion in rural and urban school children.

Occlusion	Rural		Urban		Total		p-value
	n	%	n	%	n	%	
Normal	104	40	117	45	221	42.5	0.287
Malocclusion	156	60	143	55	299	57.5	
Total	**260**	**100**	**260**	**100**	**520**	**100**	

Table-2: Gender-wise distribution of malocclusion in rural school children.

Occlusion	Boys		Girls		Total		p-value
	n	%	n	%	n	%	
Normal	74	49.33	30	27.27	104	40	0.0012
Malocclusion	76	50.67	80	72.73	156	60	
Total	**150**	**100**	**110**	**100**	**260**	**100**	

Table-3: Gender wise distribution of malocclusion in urban school children.

Occlusion	Boys		Girls		Total		p-value
	n	%	n	%	n	%	
Normal	77	55.80	40	32.79	117	45	0.0003
Malocclusion	61	44.20	82	67.21	143	55	
Total	**138**	**100**	**122**	**100**	**260**	**100**	

Table-4: Prevalence of malocclusion in rural and urban school children according to Angle's classification.

Angle's class	Rural		Urban		Total		p-value
	n	%	n	%	n	%	
Class-I	110	70.51	78	54.55	188	62.87	0.017
Class-II	40	25.64	56	39.16	96	32.11	
Class-III	6	3.85	9	6.29	15	5.02	
Total	**156**	**100**	**143**	**100**	**299**	**100**	

Table-5: Distribution of other traits of malocclusion in rural and urban school children.

Malocclusion trait	Rural school children		Urban school children		Total		p-value
	n	%	n	%	n	%	
Increased overjet	44	28.21	26	18.18	70	46.39	0.017
Increased overbite	38	24.36	21	14.69	59	39.05	
Openbite	16	10.26	34	23.78	50	34.04	
Crossbite	28	17.95	14	9.79	42	27.74	
Crowding	88	54.41	79	55.25	167	109.66	
Spacing	18	11.54	18	12.59	36	24.13	
Total	**232**	**54.72**	**192**	**45.28**	**424**	**100**	

Prevalence of various traits of malocclusion: The distribution of various traits of malocclusion in rural school children were, increased overjet 28.21%, increased overbite 24.36%, Openbite 10.26%, Crossbite 17.95%, crowding 54.41%, and spacing 11.54% while in urban school children, the values were increased overjet 18.18%, increased overbite 14.69%, Openbite 23.78 %, Crossbite 9.79%, crowding 55.25% and spacing 12.59%. Crowding was found to be the most common trait of malocclusion in both rural and urban areas as shown Table-5.

DISCUSSION

Malocclusion is a complex disorder that requires costly, exhaustive prolonged treatment and requires the services of highly skilful orthodontists. Therefore preventive measures should be sought for controlling this disorder[5]. Unlike dental caries and periodontal diseases which can be prevented to a greater extent by improving oral hygiene, the use of fluoride and diet control[6,7] malocclusion cannot be prevented by such easy methods.

In this study, the prevalence of malocclusion in rural school children was higher than urban and was more prevalent in girls than boys in both rural and urban areas. The results of this study were in agreement with the study by Khalid[4] who reported greater prevalence of malocclusion in rural (62.3%) than urban (55.3%) and more in girls than boys in Jammu and Kashmir, school children. Similarly the results of this study were also in agreement with that of Al Emran et al[8], Thilander et al[9] and Gabris et al[10] regarding prevalence of malocclusion in rural and urban school children.

The results of this study were different from an Indian study by Suma et al[1], where malocclusion was recorded more prevalent in urban school children (20.8%) than rural (14.8%). The study also reported low prevalence of malocclusion in both rural and urban school children than the present study. The reason may be due to more fibrous diet consumed by the Indian people or more oral health awareness. The slightly higher prevalence of malocclusion in rural school children in the present study may be due to increased consumption of sugar in the form of candies, chocolate, ice-cream and other sugar containing items. Low socioeconomic conditions, lack of oral health awareness and treatment facilities, may also be contributing factors. Increased sugar consumption and lack of oral health awareness results in premature loss of deciduous teeth and malocclusion[11].The prevalence of malocclusion in rural areas may have increased in the recent years but unfortunately literature lack recent studies in Khyber Pakhtunkhwa.

The prevalence of malocclusion in girls is high in both rural and urban school children in this study. These results are in agreement with the study by Saleh[12] who reported statistically significant difference in the prevalence of malocclusion in girls than boys. This higher prevalence of malocclusion in girls may be due to their religious and traditional restriction to visits male dentists, especially in rural areas. Other contributing factors may be the lack of awareness, lack of dental health facilities in public hospitals and socioeconomic conditions in Khyber Pakhtunkhwa. All these factors may provide hindrance in the prevention of malocclusion. Moreover females have been reported to prefer softer and more refined food than boys[13]. This may lead to higher caries incidence and early loss of primary teeth resulting in malocclusion.

The most common type of malocclusion in this study was Angle's class I in both rural and urban school children (70.51% and 54.25%) followed by crowding, (54.41% and 55.25%). The least prevalent

malocclusion was Angle's class III (3.85% & 6.29%). The results of this study regarding the most common type of malocclusion were in agreement with a study carried out in suburb of Islamabad by Patoli and Rashid[14] who reported Angle's Class-I to be the most prevalent malocclusion (88.8 %) followed by crowding (50 %). Similarly the results of this study were in line with a study in Tanzanian school children by Mtaya et al[15], who reported Angles Class I to be the most prevalent malocclusion. However the results of this study were contradicted by Abu Alhaija et al[16] who reported Angles Class II as the most commonly occurring malocclusion in North Jordanian school children.

The reasons for the higher prevalence of crowding in this study may be due to early loss of primary teeth, especially second deciduous molars. Malpracticing or quackery is also a contributing factor in premature loss of deciduous teeth, as quacks are not aware about the importance and role of deciduous teeth in establishing normal occlusion.

CONCLUSIONS

From this study it is concluded that:

1- More school children have malocclusion in rural areas than urban in district Peshawar.

2- Malocclusion is significantly more prevalent in girls than boys in both urban and rural areas of district Peshawar.

3- Angle's class I malocclusion and overcrowding are the most commonly occurring traits of malocclusion.

RECOMMENDATIONS

Keeping in view the results of this study, the following recommendations are made:

1. School dental health education needs to be introduced.

2. A larger study including rural and urban schools from all districts of Khyber Pakhtunkhwa may be carried out for more homogenous sample size.

REFERENCES

1. Suma S, Shekar BRC, Manjunath BC. Assessment of malocclusion status in relation to area of residence among 15 year old school children using Dental Aesthetic Index. Int J dent clin 2011; 3(2): 14-7.
2. Ash MM, Nelson S. Occlusion. In: Wheeler's Dental Anatomy, Physiology, and Occlusion. 9th ed. Philadelphia: WB Saunders; 2011;76-7.
3. Thomson H. Disturbances and disorders. In: Occlusion. 2nd ed. Oxford: Wright; 1990;p.104.
4. Khalid M. Incidence of malocclusion in school going children at Mirpur Azad Jammu and Kashmir. Journal of Animal and Plant sciences 2005; 15:43-5.
5. Profit WR, Henry W, Fields HW, Sarver DM. The etiology of orthodontic problems In: Contemporary orthodontics 4th ed.Elsevier,lndia.2007;130-60.
6. Kidd E. Should deciduous teeth are restored? Reflections of a cariologist. Dent Update 2012; 39: 159-6.
7. Kidd E, Fejerskov O. Changing concepts in cariology: Forty years on. Dent Update 2013; 40: 277-6.
8. Al-Emran S, Wisth PJ, Boe OE. Prevalence of malocclusion and need for orthodontic treatment in Saudi Arabia: Community Dent oral Epidemiol 1990; 18(5):253-5.
9. Thilander B, Pena L, Infante C. Prevalence of malocclusion and orthodontic treatment need in Bogota, Colombia. Eur J Orthod 2001; 23:153-4.
10. Gabris K, Marton S, Madlina M. Prevalence of malocclusion in Hungarian adolescents. Eur J Orthod 2006; 28:467-70.
11. Moss JP, Picton DCA. Experimental mesial drift in adult monkeys. (Macaca irus). Arch Oral Bio 1967; 12:1313-20.
12. Saleh FK, Prevalence of malocclusion in a sample of Labanese school children;East Mediterr J 1999;5(2):337-43.
13. Kharbanda O, Sidhu S. Prevalence studies on malocclusion in India: Retrospect and Prospect Journal of Indian Orthodontic Society. 1993; 24(4):115-8.
14. Patoli S, Rashid F. Prevalence of malocclusion in lethrar-a suburb of Islamabad. PODJ 2011; 31:365-6.
15. Mtaya M, Brudvik P, Astrom AN. Prevalence of malocclusion and its relationship with sociodemographic factors, dental caries, and oral hygiene in 12-tol4-years-old Tanzanian school children. Eur J Orthod 2009; 31:469-76.
16. Abu Alhaija ES, Al-Khateeb SN, Al Nimri KS. Prevalence of malocclusion in 13-15 year old North Jordanian school children: Community Dent Health 2005; 22(4):266-7.