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Prevalence of Malocclusion among 12 Years Old School Children in Kashmir, India

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Abstract: A cross-sectional study was carried out among 12 years old school children to assess the prevalence of malocclusion in Kashmir, India.16 schools (8 Government and 8 private) were randomly selected for the survey in two districts of Kashmir namely Srinagar and Ganderbal; all the schools having a minimum roll of 100 students aged 12 years old, were included for the study.An estimated sample of 1600 was examined for the presence/absence of malocclusion and also the type of malocclusion was assessed using WHO criteria of oral health assessment. The other associated occlusal traits such as overjet, overbite, rotations were also recorded. The total 1600 subjects comprised 52% (832) boys and 48%(768) girls. Of the total 1600 subjects, 1253(78.31%) were having one or the other form of malocclusion while only 347(21.68%) had normal occlusion. The prevalence of angle's class I malocclusion was found to be 65.87%(1054), 21.93% (351) had class II malocclusion; 12.18% (195) had class III malocclusion. It was concluded that majority (78.31%) of the 12years old children exhibited one or the other form of malocclusion. The prevalence of angle's class I malocclusion was found to be 65.87 %(1054), 21.93% (351) had class II malocclusion; 12.18% (195) had class III malocclusion. Class II Div 1 malocclusion was more prevalent than Class II Div 2.
Keywords: Children, Malocclusion, overjet, Prevalence, schools.

INTRODUCTION

Malocclusion is a continuum that ranges from an ideal occlusion to deviation from the normal status [1]. Due to its high rate of prevalence, malocclusion stands third after dental caries and periodontal disease [2].

Various factors that are being considered responsible for malocclusion are genetic, environmental and local (such as developmental anomalies of teeth)[3]. The abnormal dental appearance has a significant impact not only on individual's personal and social life but in the long run it greatly effects one's achievements in future career that consequently hamper the quality of life[4]. Of course nowadays masses of all age-groups especially children and adolescents are quite conscious about their dental esthetics [4]. Hence, it is the need of hour to evaluate the extent of malocclusion and its associated factors among the populace so as to treat them precisely for the end objective of amelioration of their problems they fall prey to otherwise.

Various epidemiological studies have been carried out previously in different parts of the world. Prevalence of malocclusion is found to rangebetween 20% to 43% in India [5]. Several studies have been conducted on children in mixed or permanent dentition stages [6-8]. Variation in the prevalence of malocclusion may be attributed to different study designs, study settings and variation in age groups.

It is of utmost importance to have the basic epidemiological data for planning of promotional, preventive, and curative health services in respect to tackling of the disease burden of malocclusion in the community. It has been recommended by WHOM that the prominent oraldiseases should be scrutinized under epidemiological surveys so as to assess the specific need of treatment and to plan appropriate health services in the required direction [9].

Knowledge of epidemiological status of various traits of malocclusion among particular population is important for planning the need and the provision for orthodontic service to enhance quality of life. Hence a study was carried out among 12 year old children to assess the prevalence of malocclusion in Kashmir, India.

MATERIALS AND METHODS

A cross-sectional study was carried out to assess the prevalence of malocclusion among 12 years

old school children of two districts of Kashmir namely Srinagar and Ganderbal. A sample size of 1600 was estimated using the maximum expected prevalence of 50% (WHO, Health Research Methodology, 2001). 16 schools (8 Government and 8 private) were randomly selected for the survey from the two districts of Kashmir; all the schools having a minimum roll of 100 students aged 12 years old, were included for the study. All 12 years old children present on the day of examination, mentally/physically sound and who were willing to participate were included in the study. All the children having any cranio-facial defects or those who had undergone orthodontic treatment were excluded from the study. Few days prior to the day of oral examination of the subjects; permission was taken from the school authorities, and a letter was sent to parents of the students seeking permission from them.

World Health Organization (WHO) criteria for oral health assessment were used for recording of occlusion traits. A mouth mirror and periodontal probe was used for examination. A single, calibrated examiner performed the oral examination of all subjects who were comfortably being seated on the classroom-chair under good illumination. All the subjects were examined for type of malocclusion using Angles's classification of malocclusion. Other mal-occlusal traits that were recorded included crossbite, open bite, deep bite, protrusion of teeth, tooth rotation, midline deviations and midline diastema.

RESULTS

The total 1600 subjects comprised 52 %(832) boys and 48 %(768) girls. Out of the total 1600 subjects, 1253(78.31%) were having one or the other form of malocclusion while only 347(21.68%) had normal occlusion. The prevalence of angle's class I malocclusion was found to be 65.87 %(1054), 21.93% (351) had class II malocclusion; 12.18% (195) had class III malocclusion (Table1).

Table-1: Frequency distribution subjects according to type of malocclusion and gender

Occlusion		Boys	Girls	Total
Normal		137 (39.48%)	210 (60.51%)	347 (21.68%)
Class I		553 (52.46%)	501 (4.5%)	1054 (65.87%)
Class II	Div I	198 (65.5%)	104 (34.4%)	302 (18.87%)
	Div II	20 (40.8%)	29 (59.1%)	49 (3.06%)
Class III		106 (54.3%)	89 (45.6%)	195 (12.18%)

Table-2: Frequency distribution subjects according to overjet and gender

Overjet	Boys	Girls	Total
Normal (<3mm)	597(51.91%)	553(48.06%)	1150(71.87%)
Increased (>3mm)	187(51.80%)	164(48.19%)	361(22.56%)
Decreased	41(46.06%)	48(53.93%)	89 (5.5%)

Table-3: Frequency distribution subjects according to overbite and gender

Overbite	Boys	Girls	Total
Normal	620(52.49%)	561(47.5%)	1181(73.81)
Increased	263(64.4%)	145(35.5%)	408(25.5%)
Open bite	4(36.36%)	7(63.6%)	11(0.68%)

Table-4: Frequency distribution subjects according to occlusal traits and gender

Occlusal traits	Boys	Girls	Total
Midline diastema	127(59.41%)	130(50.58%)	257(16.06%)
Tooth rotation	31(38.75%)	49(61.25%)	80(5%)

Table-5: Frequency distribution of subjects according to midline deviation and gender

Midline deviation	Boys	Girls	Total
Nil	329(54.11%)	279(45.88%)	608(38%)
Deviated to right	246(51.25%)	234 (48.75%)	480(30%)
Deviated to left	258(50.39%)	254(49.6%)	512(32%)

Table-6: Frequency distribution subjects according to cross-bite and gender

Cross bite	Boys	Girls	Total
Complete	2(66.6%)	1(33.3%)	3(0.18%)
Anterior	57(51.81%)	53(48.18%)	110(85.9%)
Posterior	9(60%)	6(40%)	15(11.7%)

DISCUSSION

Malocclusion is widespread throughout the world at an alarming prevalence next to dental caries and periodontal diseases among the populace [10]. The prevalence of malocclusion show great variation in different regions of the same country such as that found in Chennai is 19.6% while the prevalence of malocclusion among children belonging to Delhi has been documented as 90%[11]. To overcome the disease burden of malocclusion the area wise data is needed in order to undertake the preventive and curative measures for the same. Hence the present study was carried out to assess the prevalence of malocclusion among 12 years old school children in Kashmir, India.

The total sample of 1600 school children comprised of 52 %(832) boys and 48%(768) girls. 1253(78.31%) were suffering from malocclusion while only 347(21.68%) had normal occlusion in the present study. This finding was similar to the previous studies wherein 80.29% of malocclusion was found among children [12]. In other studies conducted by Arashiro[13] and Carvalho[14] depicted similar results to our present findings. In a yet another study conducted in India, 33.3% of 12 to 15 years old children were found to have malocclusion [15]. The variation in prevalence of malocclusion may be attributed to different study designs, study settings and age group and sample size.

In the current study, 65.87% (1054) had Angle's class I malocclusion while 21.93% (351) had Angle's class II malocclusion; and 12.18% (195) had class III malocclusion. This result corroborates with the findings of several previous studies; one of such studies reported that 57.24% of their study subjects had Angle Class I malocclusion, 21.73%, Angle Class II malocclusion, and 6.2% Angle Class III malocclusion [10]. In another study, it was found that Class I malocclusion were more common (87.4%) than Class II and class III. Also it was found that class II (Div 1) was more common than Class II (Div 2)[16]; this finding corresponds with the finding of our study wherein we found 18.87% of subjects were having Class II (Div 1) malocclusion whileas only 3.06% of subjects had Class II (Div 2) malocclusion.

When we look at the prevalence of normal overjet (<3mm) observed in the present study sample, it was found in 71.87% of subjects while increased (>3mm) overjet was seen in about 22.56% of the subjects and 5.5% showed decreased overjet. These findings were similar to the results of previous studies. In a study conducted by Onyeaso CO[17] in Nigeria, normal overjet was found in 66% of 12-17years old subjects; 16% showed increased overjet while 8% showed decreased overjet relationship. In studies conducted by in Jordan (24.7%)[18], Kerala (India) (23.2%)[4] and Central Anatolia(25.1%)[19], the increased overjet relationship was observed among similar proportion of subjects as found in the current study. It is worth mentioning here that few previous researchers have reported the contradictory results as far as the prevalence of increased overjet relationship is concerned; wherein one of the study results show a higher frequency of increased overjet which was as high as 61.4% kancheepuram, India[20]. While it was found to be as low as 6.3% in Karnataka, India[21]. The variation observed in the occlusal traits such as overjet relationship may be attributed to the difference in the study sample size, age, study design and variation in the ways of measurement.

In the present study, the frequency of overbite was found to be more in male subjects than female subjects. This finding corroborated with the results of previous study conducted by Daniel IB *et al*. in Brazil among 9-12 years old children, wherein they found higher prevalence of overbite in males than females [22]. In a yet another study conducted in Brazil, it was found that 18.09% of subjects had increased overbite [10]. This finding was similar to that found in our study wherein the prevalence of increased overbite was found to be 25.5%. In our study the prevalence of open bite was found to be 0.68% which was much lower that reported by Alves *et al.* in Feira de Satana (9.3%)[23].

Midline diastema is defined as the space, in millimeters, between the two permanent maxillary incisors at the normal position of the contact points [24]. 16.06% of the study sample of present study, depicted midline diastema. This proportion of midline diastema was in accordance with that found in previous study conducted in Karnataka among 12-15 years old subjects wherein the midline diastema was seen in 15.3% of the study sample. In the contrary, a higher prevalence of diastema was found in a yet another study carried out previously [25]. Such differences in the occurrence of malocclusal traits such as midline diastema, could be attributed to that the children may have had different parafunctional habits, deleterious oral habits, mouth breathing, tongue thrusting, microdontia, abnormal labial frenum, dilacerations of the central incisors, or dento-alveolar discrepancies of the jaws[25].

Limitations

- Comparison of malocclusion on the basis of school type would have given an idea about impact of socio-economic status on malocclusion.
- More districts could give a wider coverage about occurrence of malocclusion.
- Adverse effects of malocclusion could not be evaluated.

CONCLUSION

It was concluded that majority (78.31%) of the 12years old children exhibited one or the other form of

malocclusion. The prevalence of angle's class I malocclusion was found to be 65.87 %(1054), 21.93% (351) had class II malocclusion; 12.18% (195) had class III malocclusion. Class II Div 1 malocclusion was more prevalent than Class II Div 2.

RECOMMENDATIONS

- School-based oral health programs should be carried out for arousing interest of masses in favour of undertaking their orthodontic treatment so as to correct their malocclusion problems.
- Oral health professionals belonging to different specialties such as pediatric dentists, public health dentists, orthodontists; all should take collaborative steps towards counseling their patients regarding the impact of malocclusion on oral health. Also, they should undertake oral health education and awareness camps involving the schools as well as community.

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