

Prevalence of Malocclusion among 6 to 10 Year old Nalgonda School Children

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ABSTRACT

Background: To evaluate the prevalence of malocclusion among 6 to 10 year old children of Nalgonda District.

Materials & Methods: A total of 3000 children were examined, out of which 2135 children (1009 boys and 1126 girls) who fulfilled the inclusion criteria were included. The selected sample was examined for Class I, Class II, Class III molar relationship, lower anterior crowding, cross bite (anterior and posterior), open bite, and pseudo class III [edge to edge bite] discrepancies after obtaining the written consent from the concerned school authorities. The collected data was tabulated and statistically analysed using chi-square test.

Results: Among the selected sample, 648 (30.35%) children had minor tooth alignment discrepancies. Angle's Class I molar relation with and without minor discrepancies was observed in 78.6%, Class II in 13.9%, Class III in 7.8% of the subjects surveyed. Lower anterior crowding in 11.8%, anterior cross bite in 4.5%, posterior cross bite in 3.75%, openbite in 3% and Pseudo class III [edge to edge] in 5.97% was noticed among the studied population. There was no statistical significant difference observed gender wise.

Conclusion: In the current study, 52% of the studied population had malocclusion with a higher prevalence of Angle's Class I molar relation with lower anterior crowding.

Key Words: Malocclusion, prevalence, school children.

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Introduction

Developing countries like India face many challenges in rendering oral health needs as the majority of the population resides in rural areas of which more than 40% constitute children.¹ Malocclusion ranks second among the common dental diseases in children and young adults, next to dental caries.² The prevalence of malocclusion in India varies from 20% - 43%.^{3,4}

Malocclusion can be defined as an occlusion in which there is a malrelationship between the arches in any of the planes or in which there are anomalies in tooth position, number, form and developmental position of teeth beyond normal limits.⁵ In 1899, Angle has proposed a descriptive classification of malocclusion.⁶ The factors responsible for malocclusion includes genetic, environmental, or a combination of both

factors, along with various local factors such as adverse or deleterious oral habits.⁷

The epidemiological data on the prevalence of malocclusion plays a key role in providing appropriate levels of orthodontic services. Many epidemiological studies have been documented using various occlusal indices such as IOTN (Index for orthodontic treatment needs), DAI (Dental aesthetic index), ICON (Index of complexity, outcome and needs) to assess orthodontic treatment needs and aesthetics.⁸⁻¹¹ Alternative to these indices, few other occlusal characteristics such as lower anterior crowding, crossbite, openbite and pseudo Class III are measurable. No representative data on the prevalence of these occlusal characteristics is available in children with mixed dentition in Nalgonda population. The present study was therefore designed to evaluate the prevalence of minor tooth discrepancies in 6-10 year old paediatric group of Nalgonda District.

Table 1: Distribution of children according to age and gender

Age	Boys	Girls	Total
6 years	137	169	306
7 years	209	224	433
8 years	271	297	568
9 years	194	204	398
10 years	198	232	430
Total	1,009	1126	2135

Table 2: Percentage prevalence of minor tooth discrepancies

Discrepancies	Percentage
Class I without minor discrepancies	48.30%
Class I with minor discrepancies	30.30%
1. Lower anterior crowding	11.80%
2. Cross bite	4.49%
i) anterior	3.72%
ii) posterior	
3. Open bite	2.52%
anterior	0.49%
posterior	
4. Pseudo class III	5.97%
5. Oral habits	1.33%
Class II molar relationship	13.90%
Class III molar relationship	7.80%

Materials and Methods

A descriptive cross sectional study was conducted among 6 - 10 year old school children, from both rural and urban schools of Nalgonda district, Andhra Pradesh. Ethical approval was granted from institutional ethical committee. The importance of identifying minor tooth discrepancies in preventing and minimizing future orthodontic problems in children was explained and formal permission for conducting the oral examination was obtained from the head masters of concerned school.

A total of 2135 children (1009 boys and 1126 girls) aged between 6 – 10 years, with completely erupted first permanent molars and those who had not undergone any orthodontic treatment were selected. Participants with challenging conditions, craniofacial anomalies and those who were unwilling for clinical examination were excluded. The selected sample was examined clinically using mouth mirror and probe under good illumination following WHO guidelines.

The orthodontic variables evaluated were Angle's class I, II and III molar relation, anterior and posterior crossbite, openbite, pseudo class III and lower anterior crowding. The data of each individual was documented in survey proformas. The recorded data was statistically analysed using Chi-square test (χ^2) to compare malocclusion prevalence between boys and girls in different age groups. A probability value of 0.05 or less was set as the significance level.

Results

Table 1 depicts a descriptive distribution data of children according to age and gender, out of which 1009 (47%) were boys and 1126 (53%) were girls. It was observed that 48.30% of the children had class I molar relation with no minor discrepancies while 30.3 % had class I molar relation with minor discrepancies; while Class II and Class III molar relation was found in 13.9% and 7.8% of children respectively (Table 2). Lower anterior crowding was detected in 252 (11.8%) children with greater incidence in 9 year old (13.4%) boys and 8 year old (20.5%) girls (Table 3). Table 4 and 5 shows the prevalence of anterior and posterior crossbites among boys and girls in different age groups. A total of 96 (4.5%) children had anterior cross bite and 79 (3.7%)

had posterior crossbite with no significant difference observed in either of the genders. The occurrence of open bite was noticed in a total of 64 (3%) children, with significance in 9 year old (4.6%) boys and 8 year old (7.07%) girls (Table 6). Table 7 compares the incidence of pseudo class III between boys and girls of different age group. Out of 127 (5.95%) children having

pseudo class III, higher prevalence was seen in 7 year old (16.07%) girls and 8 year old (7.3%) boys.

Discussion

The present study was conducted with the objective of evaluating the prevalence of minor tooth alignment

Table 3: Prevalence of lower anterior crowding and its comparison between boys and girls

Age groups	Boys	Percentage (%)	Girls	Percentage (%)	Total	Percentage (%)
6 years	3	2.19	2	1.18	5	1.634
8 years	24	8.86	61	20.54	85	14.965
9 years	26	13.40	34	16.67	60	15.075
10 years	23	11.62	30	12.93	53	12.326
Total	98	9.71	154	13.68	252	11.803

Chi-square= 6.6931 P = 0.1531, NS

Table 4: Prevalence of anterior cross bite and its comparison between boys and girls

Age groups	Boys	Percentage (%)	Girls	Percentage (%)	Total	Percentage (%)
6 years	3	2.19	3	1.78	6	1.96
7 years	5	2.39	12	5.36	17	3.93
8 year s	19	7.01	21	7.07	40	7.04
9 years	12	6.19	3	1.47	15	3.77
10 years	11	5.56	7	3.02	18	4.19
Total	50	4.96	46	4.09	96	4.50

Chi-square= 9.1220 P = 0.0586, NS

Table 5: Prevalence of posterior cross bite and its comparison between boys and girls

Age groups	Boys	Percentage (%)	Girls	Percentage (%)	Total	Percentage (%)
6 years	0	0.00	2	1.18	2	0.65
7 years	4	1.91	9	4.02	13	3.00
8 years	16	5.90	15	5.05	31	5.46
9 years	7	3.61	12	5.88	19	4.77
10 years	2	1.01	12	5.17	14	3.26
Total	29	2.87	50	4.44	79	3.70

Chi-square= 7.3531 P = 0.1181, NS

Table 6: Prevalence of anterior open bite and its comparison between boys and girls

Age groups	Boys	Percentage (%)	Girls	Percentage (%)	Total	Percentage (%)
6 years	2	1.46	1	0.59	3	0.98
7 years	8	3.83	2	0.89	10	2.31
8 years	7	2.58	21	7.07	28	4.93
9 years	9	4.64	5	2.45	14	3.52
10 years	3	1.52	6	2.59	9	2.09
Total	29	2.87	35	3.11	64	3.00

Chi-square= 12.6252 P = 0.0132*, S (Significant)

Table 7: Prevalence of Pseudo Class III and its comparison between boys and girls

Age groups	Boys	Percentage (%)	Girls	Percentage (%)	Total	Percentage (%)
6 years	4	2.92	3	1.78	7	2.29
7 years	15	7.18	36	16.07	51	11.78
8 year s	20	7.38	34	11.45	54	9.51
9 years	10	5.15	3	1.47	13	3.27
10 years	0	0.00	2	0.86	2	0.47
Total	49	4.86	78	6.93	127	5.95

Chi-square= 12.2031 P = 0.0166*, S (Significant)

discrepancies among 6-10 year old school children in the district of Nalgonda. The prevalence of malocclusion varies from one geographical area to another and differs from one country to another and even from one city to another city. It was reported that a wide variation exists in the prevalence of malocclusion ranging from 20-43% in Indian population which can be due to variations in ethnicity and nutritional status.¹² The present study demonstrated malocclusion in 52% of the school children which was less as compared to the studies reported by Das et al;¹³ Prasad et al;¹⁴ and high when compared to Kharabanda et al.(1995).¹⁵

The prevalence of malocclusion according to Angle's classification was as follows: Class I molar relation with and without minor discrepancies in 78.6%, Class II in 13.9%, Class III in 7.8% of the subjects surveyed. Few other Indian studies reported varied prevalence of molar relation in different population such as Prasad et al¹⁴ (Class I 95, Class II 4, Class III 9); Kharabanda et al.¹⁵ (Class I 91.6%, Class II 6%, Class III 2.3%); Šidlauskas et al.¹⁶,(Class I 68.4%, Class II 27.7%, Class III 2.3%); Trehan et al.¹⁷ (Class I 57.9%, Class II 7.4%, Class III 1.4%); Das et al.¹⁸ (Class I 62%, Class II 8.9%, Class III 1.4%).

In the current study, 11.80 % of the study population had lower anterior crowding which was in consistent with the results reported by Kharabanda et al;¹⁵ Kumar DA et al.¹⁹ In contrast, a higher prevalence rate was reported by Johnson and Harkness,²⁰ Garcia et al,²¹ Suresh babu et al,³ Shivakumar KM et al.²²

In the anteroposterior direction, it was noted that anterior crossbite was present in 4.49% of the children. Similar studies conducted by Marcos Alan et al ²³ and Tausche et al ²⁴ reported an incidence of 10.41% and

3.2% respectively. In transverse direction, posterior crossbite was noticed in 3.72% of the children studied. This result is somewhat lower than the finding reported by Proffit,²⁵ Wilems²⁶ and Thilander;²⁷ Brito et al²⁸ and Cavalcanti et al²⁹, who found this alteration in 8 to 16%; 19.2% and 20.18% of the children, respectively. In vertical plane, the prevalence of open bite (3.01%) was less when compared to the results of Alves et al ³⁰ (9.3%) and Brito et al (7.8%).²⁸ Girls had a slightly higher prevalence than boys; however, the difference was not statically significant which was in accordance with Graber and Lucker³¹ and Reddy VR³²

Conclusion

It is of considerable importance to the dental surgeon to recognise the early manifestations of malocclusion especially during growth due to constant occlusal variations. Epidemiological surveys would provide baseline data enabling the dental surgeon to orient his/her treatment to avoid jeopardising the prognosis for later orthodontic therapy, and even fosters the development of normal occlusion. In the current study, 52% of the studied population had malocclusion with a higher prevalence of Angle's Class I molar relation with lower anterior crowding. Nevertheless, most of the malocclusions may correct themselves or worsen with time depending on the growth pattern or environmental factors.

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