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Relationship of Angle's Molar Malocclusion with Facial Profile among School Children with the Age Group of 11 to 16 Years at Dhaka City in Bangladesh

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Abstract

Background: Orthodontic care globally urges the need to develop various methods to assess and grade malocclusion in order to prioritize treatment **Objective:** The purpose of the present study was to describe Angle's molar relationship among the study subjects with the facial profile. **Methodology:** This study was designed as a Descriptive Cross-Sectional study carried out in four high schools in Dhaka city, Bangladesh. The study was conducted from May 2015 to November 2015 for a period of 06 (six) months on 384 secondary school children aged between 11 – 16 years Systematic Random Sampling from four high schools in Dhaka city. The participants were included who had no preventive and interceptive orthodontic treatment previously carried out and participants having late mixed or early permanent dentition. The participants were excluded participants having major local problems such as trauma or any history of surgical approach which affects the growth and development of facial structures or body, Students who are undergoing orthodontic treatment or who have completed orthodontic treatment earlier, Students who are suffering from any systemic disease. Data were collected using a preformed data collection sheet. The relevant socio-demographic data of these patients were collected and recorded. Data were collected and Parents/ guardians were provided with a description of the study, an informed consent form (written in Bengali) and a family history/ lifestyle questionnaire (written in English). In addition, trained research assistants were explained the study procedures. **Results:** Out of 384 children, the maximum no. of Angle's molar relationship was Class I in both sides, similarly maximum no. of Canine relationships was Class I in both sides. Maximum face form was oval (51.8%), maximum (57.6%) face profile was straight and maximum (76.6%) lips were competent. Conclusion: In this study, malocclusion was 56.7%. Angle's class I malocclusion is the most common while Angle's class III is the least prevalent malocclusion. *[Journal of National Institute of Neurosciences Bangladesh, July 2022;8(2):206-209]*

Keywords: Malocclusion, School Children; Crowding; Overjet; Deep bite; Cross bite; Midline Diastema

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Introduction

The epidemiological data on the prevalence of malocclusion plays a key role in providing appropriate levels of orthodontic services. There are several methods

to evaluate, describe and classify occlusion. Since its development, the dental aesthetic index (DAI) has proven to be simple and rapidly applied[1]. A previous report has demonstrated the high reliability and validity of this index, which also compares favorably with other indices[2-3]. It is a cross-cultural index that links clinical and esthetic components mathematically to produce a single score.

This index can be used for different communities and populations without requiring any modification[4]. Another method is Angle's classification of the malocclusion[5], which was based on molar relationships and offered a clear description of normal occlusion as well as subdividing of the major types of malocclusions. Angle's classification was a milestone in the development of orthodontics not only to classify the malocclusions but also to include the first simple and clear definition of normal occlusion of the natural dentition. This method has probably been the most used instrument to record malocclusions until now[6]. The purpose of the present study was to describe Angle's molar relationship among the study subjects with the facial profile.

Methodology

Study Settings and Population: This study was designed as a descriptive cross sectional study was carried out in four high schools in Dhaka city, Bangladesh. The study was conducted from May 2015 to November 2015 for a period of 06 (six) months on 384 secondary school children aged between 11 to 16 years Systematic Random Sampling from four high schools of Dhaka city. The participants were included who had no preventive and interceptive orthodontic treatment previously carried out and participants having late mixed or early permanent dentition. The participants were excluded participants having major local problems such as trauma or any history of surgical approach which affects the growth and development of facial structures or body, Students who are undergoing orthodontic treatment or who have completed orthodontic treatment earlier, Students who are suffering from any systemic disease. This study was approved by the institutional review board (IRB) of this hospital.

Study Procedure: Data were collected using a preformed data collection sheet. The relevant socio-demographic data of these patients were collected and recorded. Data were collected and Parents/ guardians were provided with a description of the study, informed consent form (written in Bengali) and a family history/ lifestyle questionnaire (written in English). In addition, trained research assistants were explained the study procedures. Data were obtained from noninvasive physical examination and completion of the questionnaire. Examined data were recorded on specifically designed forms containing identification number age, sex, address, and telephone number of the participant or guardians in addition to the occlusal features.

Statistical Analysis: All data were recorded systematically in preformed data collection form (questionnaire) and quantitative data were expressed as mean and standard deviation and qualitative data were expressed as frequency distribution and percentage. Statistical analysis was performed by using window-based computer software devised with Statistical Packages for Social Sciences (SPSS-17) (SPSS Inc, Chicago, IL, USA). 95% confidence level was taken. Uniformly distributed data was evaluated by ANOVA, Student t-test and significance was defined as 'p' value < 0.05.

Results

Table 1 showed distribution of participants according to Angle's molar relationship in malocclusion and normal occlusion participants. In malocclusion, Class I molar relationship was 140 (64.2%), Class II was 48 (22.0%) and Class III was 30 (13.8%) in right side, similarly Class I molar relationship was 134 (61.5%), Class II was 56 (25.7%) and Class III was 28 (12.8%) in left side. There was statistical significant difference in molar relationship between malocclusion and normal occlusion group.

Table 1: Association of Malocclusion according to Angle's Molar Relationship

Angle's molar relationship	Malocclusion		P value
	Present	Absent	
Right side			
Class I	140 (64.2%)	166 (100.0%)	
Class II	48 (22.0%)	0 (0.0%)	
Class III	30 (13.8%)	0 (0.0%)	0.001
Left side			
Class I	134 (61.5%)	166 (100.0%)	
Class II	56 (25.7%)	0 (0.0%)	
Class III	28 (12.8%)	0 (0.0%)	0.001

Chi-square test was done to measure the level of significance.

Figure I showed distribution of participants according to extra-oral findings. Maximum face form was oval (51.8%). Maximum (57.6%) face profile was straight and maximum (76.6%) lips were competent. Among

malocclusion participant maximum face form was oval (50.9%), maximum (58.3%) face profile was straight and maximum (77.5%) lips were competent.

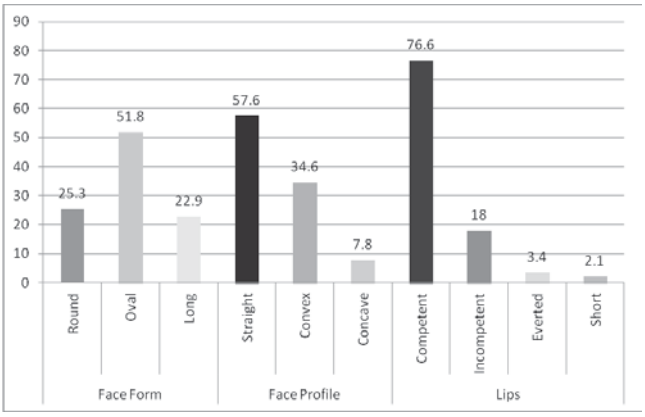

Table 2 showed distribution of participants according to intra oral findings. Maximum no. of Angle's molar relationship was Class I in both sides, similarly maximum no. of Canine relationship was Class I in both sides. Complete overbite was in 77.1% cases

Table 2: Distribution of participants according to intra-oral findings

Variables	Present	Absent
Angle's molar relationship		
• Class I	306 (79.7%)	300 (78.1%)
• Class II	48 (12.5%)	56 (14.6%)
• Class III	30 (7.8%)	28 (7.3%)
Canine relationship		
• Class I	289(75.3%)	282(73.4%)
• Class II	74(19.3%)	80(20.8%)
• Class III	21(5.5%)	22(5.7%)
Over Bite		
• Complete	296	(77.1%)
• Incomplete	88	(22.9%)

Table II showed number of needle stick injury to surgeon's hand. It was observed that the mean number of perforation of hand gloves were significantly more in Group A (4.15 ± 1.46) as compared to Group B (0). The difference was statistically significant (P value <0.001) between two groups.

Discussion

Occlusion has defined a manner in which the upper and lower teeth intercuspate between each other in a result of neuromuscular control of the components of the mastication systems namely: Teeth, Periodontal structures, maxilla and mandible, temporo-mandibular joints and their associated muscles and ligaments[5]. Epidemiological studies of occlusion and malocclusion not only help in orthodontic treatment planning and evaluation of dental health services but also offer a valid research tool for ascertaining in the aetiology of malocclusion. Present study was conducted with the aim of assessing the frequency of malocclusion among school children aged 11-16 years in Dhaka City Bangladesh.

Reddy et al[7] revealed that prevalence of malocclusion among school children was 52.0% cases. 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% subjects. Ajayi[8] revealed that 15.9% of the subjects had normal occlusion, 80.7% had Angle's class I and 1.1% had Angle's class II div 1, 0.5% had Angle's class II div 2 and 1.8% Angle's class III malocclusion. Romano et al[9] found 13.4% normal occlusion and (86.6%) malocclusion 55.7% with Class I malocclusion, 24.9% with Class II and 6.0% with Class III. The prevalence of malocclusion was found to be Angle's Class I (52.90%), Karki et al[10] found Angle's Class II (5.10%) and Angle's Class III (9.40%). In this study, Angle's class I malocclusion is the most common while Angle's class III is the least prevalent malocclusion which is consistent with the above studies.

In this study, maximum no. of face form was oval (51.8%), maximum no. of (57.6%) face profile was straight and maximum no. of (76.6%) lips were competent. Among malocclusion participant maximum face form was oval (50.9%), maximum (58.3%) face profile was straight and maximum (77.5%) lips were competent. There was no significant difference in face form, face profile and lips in malocclusion.

In this study, maximum no. of Angle's molar relationship was Class I in both sides, similarly maximum no. of Canine relationship was Class I in both sides. Complete over bite was in 75.0% cases. In malocclusion, Class I molar relationship was 140 (64.2%), Class II was 48 (22.0%) and Class III was 30 (13.8%) in right side, similarly Class I molar relationship was 134 (61.5%), Class II was 56 (25.7%) and Class III was 28 (12.8%) in left side. There was statistically significant difference in molar occlusion between malocclusion and normal occlusion group.

Conclusion

In this study, Angle's class I Malocclusion is the most common while Angle's class III is the least prevalent malocclusion. The maximum no. of face form is oval and the maximum no. of face profile is straight

Maximum no. of lips was competent.

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