An Observational Study Assessing Malocclusion in Boys and Girls from Rural Areas of Rajapur, Bangladesh

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ABSTRACT

Background: Malocclusion is defined as an irregularity of the teeth or a malrelationship between the dental arches beyond the range of what is accepted as normal. It has large impact on individual and society in terms of discomfort, quality of life and social and functional limitations. The etiology of malocclusion may be genetic, environmental or more commonly a combination of them.

Objective: To evaluated the malocclusion in children boys and Girls in the rural area

Methodology: A cross sectional obsevational survey was conducted among rural area (374) school- age children of Barishal Rajapur Upazila in Bangladesh. A total of 374 children randomly selected boys and girl was examined for Class I, Class II, Class III molar relationship, increased over jet, increased over bite, open bite, crowding, cross bite and spacing after obtaining the written consent from the students, legal guardians and school authorities.

Results: The majority 139(74.3%) patients were found malocclusion in male and 123(65.8%) in female group. The difference was not statistically significant (p=0.071) between two groups. The majority 111(79.9%) participants were found Angle's class I in male and 85(69.1%) in female group. The difference was not statistically significant (p=0.080) between two groups. Increased overjet, increased overbite, open bite, cross bite, crowding and spacing were not statistically significant (p>0.05) between two groups.

Conclusion: In this study suggested majority respondents were found malocclusion in boys in comparison to girls group but not statistically significant. No significant difference were found increased overjet, increased overbite, open bite, cross bite, crowding and spacing   in boys and girls.

INTRODUCTION

Malocclusion is defined as an irregularity of the teeth or a mal relationship between the dental arches beyond the range of what is accepted as normal. It is a multifactorial oral condition caused by general factors such as heredity, congenital defects, nutritional deficiencies and abnormal pressure habits.[1]

According to the generally accepted Dahlgren and Whitehead's model, biological factors (age, sex, genetic factors), life style, social support networks and socio-economic, cultural and environmental factors belong to these factors.[2] Several authors classified etiologies of malocclusion in different patterns.[3] Moyers[4] classified the etiologies of malocclusion into six categories: hereditary, developmental cause of unknown origin, trauma,

physical agents, habit, and diseases; whereas Proffit et al.[5] classified the etiologies of malocclusion into three categories, which are specific causes of malocclusion, environmental influences, and genetic influences. Although some etiologies of malocclusion cannot be totally eliminated, they could be prevented and reduced by performing early treatment in the proper time to reduce the progression of some malocclusions.[6]

The early treatments, known as preventive and interceptive orthodontic treatment, can be performed during the development of dentition period when the child still has active growth. Early orthodontic treatment in children who know orthodontic treatment prevents the occurrence of malocclusions. Knowing orthodontic treatment plays a role in changing children's perspective on orthodontic treatment, and enables them to be aware of their dental problems and to have a say in their treatment.[7]

It is stated that the main reasons for the lack of orthodontic treatment for individuals with malocclusion are the lack of information about the malocclusion, lack of resources, literacy rate, and socioeconomic status.[8,9]

Numerous studies have been published regarding the prevalence of malocclusion in various populations. The results have shown wide variations. Differences in the age ranges of the populations studied, the number of subjects examined and differences in the registration methods are probably the most important factors explaining these variations.[10] The aim of the study to evaluation of malocclusion in the children boys and girls in the village in Rajapur area.

METHODOLOGY

A cross- sectional observational survey was conducted among rural area (374) school- age children of Barishal, Rajapur Upazila in Bangladesh. A total of 374 children boys and girls was examined for Class I, Class II, Class III molar relationship, increased over jet, increased over bite, open bite, crowding, cross bite and spacing after obtaining the written consent from the students, legal guardians and school authorities. The inclusion criteria were 1) School- age children 08- to 12 years old in selected school irrespective of sex without the history of previous orthodontic treatment. 2) Participants with completely erupted first permanent molars. The exclusion criteria were 1) Unwillingness of participant's as well as their legal guardian in the study. 2) Mentally compromised participants and participants with craniofacial anomalies. Four primary school (Girls and Boys) were randomly selected from a total 115 primary schools (Girls/Boys) of Rajapur Sadar Upazilla. Out of four schools, two was urban and two was in rural areas. The study subjects were selected from a list of school children by using stratified random sampling procedures in each school. Boys and Girls were randomly distributed. The participants were selected by random sampling method which fulfills the predetermined selective criteria. A prior notification and written consent form was sent to the head of the school for permission to carry out the study. A written assent form was given to the participant prior to commencement of study. A written consent form was given to the participant's legal guardian. Materials and instruments required: 1) Informed written assent and consent forms from study participants along with their legal guardians,2) Preformed Data collection sheet 3) Pens 4) Torch light 5) Disposable diagnostic materials (calibrated probe, mirror) 6) Mask and 7) Gloves. The study sample along with their guardians was requested to give their agreement to participate in the study. The teacher was given a brief introduction about the investigator to the children. The investigators were addressing any concern or clarification that the students may require before carrying out the data collection. Their data was collected by the dental Health check up.The oral health education lecture was given to all the children in the school to create awareness about dental health and Orthodontic treatment. After taking informed written consent from the guardians of study participants, assent from the minors and approval from ethical committee of BSMMU, school children were examined in ordinary chair using torch light and disposable diagnostic tools (periodontal probe, mirror, measurement scale). Study models and radiograph was not taken. Class I, Class II and class II molar relationship and various traits of malocclusion was recorded by using Angle's classification. Over jet was measured by periodontal pocket measuring calibrated probe. It was increased when the horizontal space between upper and lower incisors are more than 3 mm or normal. The normal value of overbite is 1 to 3 mm but it varies with the length of incisors. When space remains between upper and lower teeth in centric occlusion then open bite was noted. Crossbite was recorded when there are an abnormal labiolingual or buccolingual relationship of the upper and lower teeth when the mouth was closed in normal occlusal position. Crowding was noted when there was overlying of two or more teeth or minimum 2mm space lack in each

quadrant. Spacing was collected when diastema was present between two nearby teeth or extra space of at least 2mm was existing in each quadrant.

RESULT

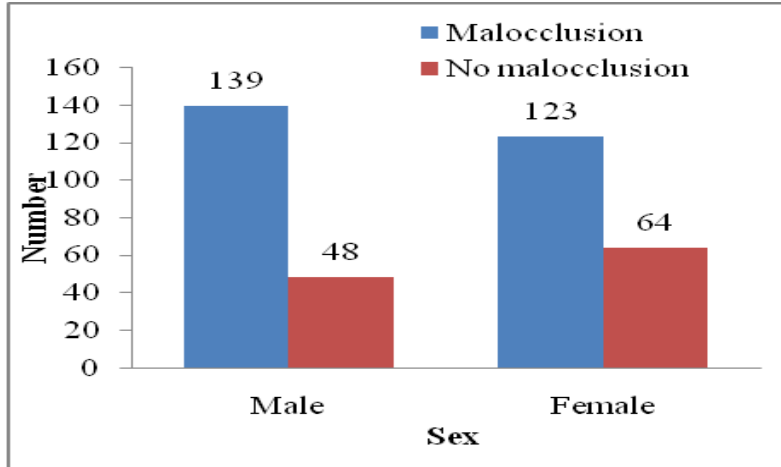Total 374 patients come from rural area among them 187 patients were male and 187 were female.

Figure 1: Association between malocclusion with gender in rural area in Rajapur

Figure 1 shows that majority 139(74.3%) patients were found malocclusion in male and 123(65.8%) in female group. The difference was not statistically significant (p=0.071) between two groups.
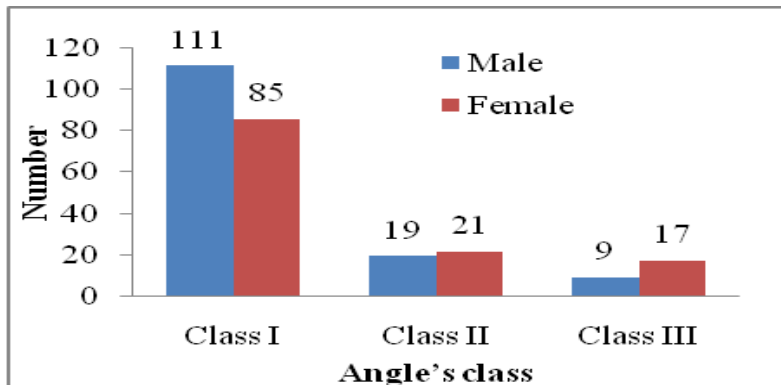

Figure 2: Distribution of Angle's classwith gender in rural area in Rajapur

Figure 2 shows that majority 111(79.9%) participants were found Angle's class I in male and 85(69.1%) in female group. The difference was not statistically significant (p=0.080) between two groups.

Table 1: Association between different variables of malocclusion with sex in rural area of Rajapur

Type of malocclusion	Total	Sex		p value
		Male (n=139)	Female (n=123)	
Increased overjet	50	24 (17.3)	26 (21.1)	0.426
Increased overbite	197	110 (79.1)	87 (70.7)	0.116
Open bite	16	10 (7.2)	6 (4.9)	0.435
Cross bite	20	12 (8.6)	8 (6.5)	0.517

Crowding	**173**	89 (64.0)	84 (68.3)	0.467
Spacing	**56**	33 (23.7)	23 (18.7)	0.320

Table 1 show that increased overjet, increased overbite, open bite, cross bite, crowding and spacing were not statistically significant (p>0.05) between two groups.

DISCUSSION

In this study showed that the majority 139(74.3%) patients were found malocclusion in male and 123(65.8%) in female group. The difference was not statistically significant (p=0.071) between two groups. Balachandranet al.[11] reported males had a higher proportion of malocclusion (36.20%, CI: 36.12–36.28, 33 studies, 40456 participants) than females (31.98%, CI: 31.93–32.03, 33 studies, 36938 participants). Similarly, systematic review of prevalence of malocclusion among Indian children and adolescents showed a higher prevalence of malocclusion among males than females.[1]Higher susceptibility of malocclusion among 8–15 years males can be attributed to their delayed growth spurts.[12] Narayanan et al.[13] reported the 2,366 children examined for the prevalence of malocclusion, 54.1% were boys and 45.9% were girls. Khan et al.[14] observed 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. These results are in agreement with the study by Saleh[15]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. More over females have been reported to prefer softer and more refined food than boys.[16]This may lead to higher caries incidence and early loss of primary teeth resulting in malocclusion.

In this study observed the majority 111(79.9%) participants were found Angle's class I in male and 85(69.1%) in female group. The difference was not statistically significant (p=0.080) between two groups. Mehta et al.[1] reported class I malocclusion was most common affecting more than half of the children (51.3%. CI 36.2, 66.3). Class II malocclusion affected 10.2% (CI 6.3, 14.9) and just 2.2 % (0.8, 4.2) children had class III malocclusion. Boys had higher proportion of class I and III whereas class II malocclusion was more prevalent in girls. Boys reported higher overall prevalence than girls. Class I malocclusion was most common affecting more than half of the children (51.3%. CI 36.2, 66.3). Narayanan et al.[13] reported the distribution of subjects based on gender and Angle's classification was not statistically significant. Khan et al.[14] observed 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[17]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 Mtayaet al.[18] who reported Angles Class I to be the most prevalent malocclusion. However the results of this study were contradicted by Abu Alhaijaet al.[19]who reported Angles Class II as the most commonly occurring malocclusion in North Jordanian school children.Rubby et al.[20] reported the distribution of malocclusion by Angle's classification between male and female, also female patients presented with high number of Class I and Class II malocclusion with significance value (p value < 0.05), which was inconsistent with the study conducted by Onyeaso et al.[21] where they showed that male have significantly more Class II and Class III molar relationship than female.

In current study showed that increased overjet, increased overbite, open bite, cross bite, crowding and spacing were not statistically significant (p>0.05) between two groups. Narayanan et al.[13] reported thetotalchildrenexamined,64.1%hadnormal overbite (<3 mm), 35.6% had an increased overbite (>3 mm) and a small percentage (0.29%) had open bite. The gender distribution was statistically significant in this group.

Reddy et al.[22] reported the occurrence of open bite was noticed in a total of 64 (3%) children, with significance in 9 years old (4.6%) boys and 8 year old (7.07%) girls.

Conclusions: In this study suggested majority respondents were found malocclusion in boys in comparison to girls group but not statistically significant. No significant difference were found increased overjet, increased overbite, open bite, cross bite, crowding and spacing in boys and girls.

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