ABSTRACT

Introduction: Malocclusion is the irregularity of teeth and is considered as oral health problem. Though etiology of malocclusion is multifactorial, it has considerable impact on the self esteem and social adjustment of an individual.

Objective: To determine the prevalence of malocclusion and to assess the association between Angle classification of malocclusion and occlusal traits.

Materials & Method: A cross sectional study was conducted among 138 Tibetan students of grade 8-12 were selected. Students with history of orthodontic treatment were excluded from the study. Data was recorded and analyzed using SPSS 17.0 and chi square test was used to evaluate the association between Angle classification of malocclusion and occlusal traits.

Result: The prevalence of malocclusion was found to be Angle’s Class I (52.90%), Angle’s Class II (5.10%) and Angle’s Class III (9.40%). Occlusal traits such as overbite, increased overjet, openbite, crossbite, displacement and hypodontia was found to be 5.79%, 10.8%, 10.86%, 9.42%, 50.72% and 4.34% respectively.

Conclusion: The prevalence of malocclusion among Tibetan adolescent was found to be higher. Hence, oral health awareness, preventive procedures and promotional programs need to be more emphasized.

Keywords: adolescent, Angle classification, malocclusion

INTRODUCTION

The normal occlusion defined by Angle was that the mesiobuccal cusp of the upper first molar should occlude in the buccal groove of the lower first molar and teeth were arranged on a smoothly curving line of occlusion. Dental occlusion may vary among individuals, age, race, gender and ethnic group. It may be as a result of variation in tooth size and shape, tooth position, sequence and timing of eruption, shape and size of dental arch and pattern of craniofacial growth.

Malocclusion is not a disease but a developmental anomaly of teeth and/or dental arch resulting from various etiological factors causing esthetic dissatisfaction to functional impairment and even disability. Malocclusion has been affecting on people physiologically and psychologically as a consequent it has impact on their quality of life and well-being. Beside, it has been adding economic burden as orthodontic treatment is considered as one of the expensive oral health problem to treat. According to World Health Organization (WHO), malocclusion occurs in majority of the population and it is considered as one of the major oral health problem.

Various epidemiological studies have been conducted worldwide to assess the prevalence of malocclusion and to describe the occlusal trait. In this context, very few studies have been conducted in Tibetan population. Thus, this study was conducted to assess the prevalence of malocclusion and occlusal traits in Tibetan adolescents.

MATERIALS AND METHOD

A cross sectional study was conducted among the Tibetan students studying in grade 8-12 of SOS Hermann Gmeinier Higher Secondary School, Pokhara. This study was conducted after obtaining ethical approval from the Institutional Review Committee, Kantipur Dental College Teaching Hospital and Research Center.

A total of 138 students with no history of orthodontic treatment were examined after obtaining permission from the concern authorities and along with the consent of school principal and students. All the examinations were
carried out by four trained dentists under the supervision of an Orthodontist. The examination was done in the school recreation hall on wooden chairs under adequate daylight with the help of mouth mirror, dental explorer, pencil, stainless steel millimeter scale and divider and maximum aseptic environment was maintained.

The data was recorded and analyzed using SPSS version 17.0. The descriptive statistics was assessed and the association between Angle’s classification of malocclusion and occlusal traits were assessed using chi-square test ($p < 0.05$).

**Variables in the study:**

Molar Relationship: The relationship between upper and lower first permanent molars were used to determine Angle’s Class I, Class II or Class III malocclusions.

**Overbite:** Measurements between 0 to 3.4 mm were considered normal, while the other categories includes: increased overbite greater than or equal to 3.5 mm without gingival trauma, complete overbite without gingival or palatal trauma and complete overbite with gingival or palatal trauma.

**Overjet:** Measurements between 0 to 3.4 mm were considered normal, while the other categories of increased overjet includes: greater than 3.5 mm but less than or equal to 6 mm, greater than 6 mm but less than or equal to 9 mm and greater than 9 mm.

**Openbite (Anterior):** Open bite in anterior region greater than 1 mm but less than or equal to 2 mm were considered as anterior openbite and other categories includes: open bite greater than 2 mm but less than or equal to 4 mm and open bite greater than 4 mm.

**Crossbite (Anterior):** When there was a crossover of at least one tooth in the anterior region of the dental arch were considered as anterior crossbite. Categories includes: crossbite with less than or equal to 1 mm discrepancy, crossbite with greater than 1 mm but less than or equal to 2 mm discrepancy and crossbite with greater than 2 mm discrepancy.

**Displacement:** Displacement is the distance between the natural contact points of the adjacent teeth; which is not a measure of crowding. Measurements 0 to 1 mm were considered normal, while other categories are: displacement of teeth greater than 1 mm but less than or equal to 2 mm, displacement of teeth greater than 2 mm but less than or equal to 4 mm and severe displacements of teeth greater than 4 mm.

**Hypodontia:** Hypodontia/missing space requiring pre-restorative orthodontics or orthodontic space closure to omit the need for prosthesis were considered as less extensive while need of prosthesis of more than one tooth missing in any quadrant requiring pre-restorative orthodontics were considered as extensive hypodontia.

**RESULT**

A total of 138 Tibetan students were examined among which 78 were female and 60 were male. The study showed that 32.60% had normal occlusion whereas the prevalence of malocclusion were Angle’s Class I (52.90%), Angle’s Class II (5.10%), and Angle’s Class III (9.40%) respectively (Figure 1).

The present study showed that 5.79% had increased overbite while 10.8% had increased overjet. It was also observed that 10.86% had openbite, 9.42% had crossbite, 50.72% had displacement and hypodontia was seen in 4.34% respectively (Table 1). The present study revealed that there was statistical significant association between overbite, overjet, crossbite (anterior), hypodontia and Angle classification of malocclusion ($p<0.05$). It also revealed that there was statistically significant association between displacement and Angle classification of malocclusion ($p<0.05$). The present study showed that the association between openbite (anterior) and Angle classification of malocclusion were not statistically significant ($p<0.05$).
Karki S, Parajuli U, Kunwar N, Namgyal K, Wangdu K: Distribution of Malocclusion and Occlusal Traits among Tibetan Adolescents residing in Nepal

**DISCUSSION**

In this present study, the prevalence of Angle’s Class I malocclusion was found to be higher which is similar to other studies. The present study showed that the normal occlusion was found to be 32.60% while the study conducted by Farahani AB et al found that 22.9% had normal occlusion similarly Arabiun H et al and Singh VP et al found that 76.30% and 14.42% had normal occlusion respectively. Wada T et al examined 2000 subjects and found that 3.4% had class III malocclusion similarly Sharma JN with sample of 134 found 5.97%, Shrestha BK et al found 16%, Baral P found that 15.6% among 260 mongoloid patients, Shrestha S et al found 8.40% and Singh VP found 4.32% had class III malocclusion where as in this study with sample 138, 9.40% had class III malocclusion.

The present study showed that 5.79% had increased overbite which was similar to the other studies where as it was found to be higher in a study conducted by Ciuffolo F et al. With respect to overjet, Tang EL found 14.9% had increased overjet similarly Shrestha S et al, Singh VP et al Farahani AB et al, Jamilian A, Ciuffolo F et al reported that 43.75%, 17.51%, 24.5%, 22.7% and 41.0% had increased overjet respectively which is higher in comparison to the present study. Various studies conducted by Gabris K et al, Tang EL, Singh VP et al Farahani AB et al, Arabiun H et al, Ciuffolo F et al and Aikins EA et al also reported that 8.9%, 1.5%, 2.03%, 1.6%, 0.82%, 1.7% and 7.1% had anterior openbite which was comparatively lower than the present study which has 10.86% openbite. Concerning crossbite, Farahani AB et al and Baral P also reported that 8.4% and 10.4% (among Aryan) had crossbite which was supported by the present study. In a study conducted by Shrestha S et al on 464 study models reported that 65.73% had displacement which is higher than the present study.

**CONCLUSION**

The result of this study showed that the prevalence of malocclusion among Tibetan Adolescents was found to be higher typically Angle Class I (52.90%). Occlusal traits such as increased overbite, increased overjet, openbite, crossbite displacement and hypodontia was found to be 5.79%, 10.8%, 10.86%, 9.42%, 50.72% and 4.34% respectively. The association between overbite, overjet, crossbite (anterior), hypodontia and displacement on Angle classification of malocclusion were found to be statistically significant (p < 0.05).

Hence, it can be concluded that more emphasis on oral health awareness, preventive procedures and promotional programs can be advocated to this group.
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