PREVALENCE OF MALOCCLUSION AMONG MEDICAL STUDENTS IN INSTITUTE OF MEDICINE, NEPAL: A PRELIMINARY REPORT

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ABSTRACT

Introduction: Malocclusion is a malrelationship between the arches in any of the planes or in which there are anomalies in tooth position beyond the normal limits. The epidemiological data has a key role in planning which varies among different countries, ethnic groups and age groups. **Aims and objective:** To find out the prevalence of malocclusion among medical students of IOM. **Materials and method:** Quantitative, cross-sectional descriptive study among MBBS students of Maharajgunj Medical Campus from first year to final year was done; participating voluntarily. A standard format was prepared to record the data. **Result:** Normal occlusion was found to be in 9.6%. The prevalence of Class I, Class II and Class III malocclusion were 44.09 %, 30.1 % and 16.12 % respectively. The various occlusal traits included increased overjet (12.9 %), increased overbite (26.9 %), scissor bite (3.2 %), posterior crossbite (18.3 %), spacing (12.9 %), Crowding (51.5 %), missing teeth (18.3 %). **Conclusion:** The prevalence of normal occlusion is 9.6% and malocclusion is found to be 90.4%. Class I malocclusion is most prevalent followed by Class II malocclusion and the Class III malocclusion.

Keywords: Malocclusion, Medical students, Prevalence

INTRODUCTION

The malocclusion is a malrelationship between the arches in any of the planes or in which there are anomalies in tooth position beyond the normal limits.[1] According to Klages and Zenter, a person with malocclusion may refrain oneself from social contacts, may lose career opportunities and might feel shame about their dental appearance.[2] The malocclusion has been shown to affect oral health, increased prevalence of dental caries and can cause temporomandibular joint disorders.[1]

Although some people seek orthodontic treatment to improve their oral functional ability, most of the patients seek orthodontic treatment because of their desire to look attractive and to improve their self-esteem.[3,4,5] The benefits of taking orthodontic treatment include prevention of tissue damage, improvement of esthetics as well as the physical function.[6] The epidemiological data has a key role in planning appropriate levels of orthodontic services. The occurrence of occlusal anomalies varies between different countries, ethnic and age groups.[7,8,9,10,11,12] The incidence of malocclusion has been reported to vary from 11 % to 93 % in different parts of the world.[8,9,10,11,12] Even in our neighboring country India, different studies have shown variation in the prevalence of malocclusion from 20 % - 43 %.[13,14,15]

Although a study[16] was done to evaluate the pattern of malocclusion among patients seeking orthodontic treatment in one of the hospitals in eastern Nepal, the study to evaluate the prevalence of malocclusion is not done so far in Nepal.

AIMS AND OBJECTIVE

The general objective of the study was to find out the prevalence and various grades of malocclusion among IOM Medical students. The specific objective were to find out the prevalence of normal occlusion, to identify the proportion of Class I, Class II and Class III malocclusion, to compare the prevalence of malocclusion between male and female

subjects, and to establish a baseline data of prevalence of malocclusion for further studies.

MATERIALS AND METHOD

To conduct the given study; ethical clearance was obtained from the Ethical Review Board of IOM. The study design was quantitative, descriptive study. The study population consisted of all MBBS students from first year to final year of Maharajgunj Medical Campus. Students were asked to participate voluntarily in the study. Subjects with craniofacial anomalies (e.g. clefts and syndromes) and non-Nepali nationals were excluded from the study.

For data collection; a survey format based on World Health Organization guidelines[17] was developed to record general background information and different variables related to malocclusion.

After obtaining the consent, each subject was examined in Orthodontic section of Dental OPD, TU Teaching Hospital. The examination was done following the WHO guidelines (1985).[17] All the examinations were done by single examiner. The assessment of dental occlusion was carried out using latex gloves, mouth mirrors, and millimeter rulers. No radiographs, study casts, or previous written records were used for the purpose of this study. Malocclusion assessment recorded and measured intra-orally is as reliable as assessment on study casts.[18] Personal data and information about orthodontic treatment were obtained directly from the students.

Following orthodontic variables were measured:

Molar relationship: The relationship between the upper and lower first permanent molars was determined according to Angle's classification of malocclusion. Patients with subdivision malocclusions were included in the Class II or Class III groups on the basis of the predominant occlusal characteristic, or according to the relationship between the canines.

Overjet (OJ): The distance between the edge of the upper central incisor and the labial surface of the lower central incisor, measured in millimeters using a metal ruler. The overjet from 0 mm to 3.5 mm was accepted as normal. The increased overjet from the point of clinical relevance was divided into three groups: from 3.5 to 6 mm, from 6 to 9 mm, and more than 9 mm, respectively.

Overbite (OB): The perpendicular distance from the edge of the lower central incisor to the upper central incisor edge, measured in millimeters. The dimension less than 0 mm was considered as open bite, 0 to 4 mm as normal overbite, and more than 4 mm as deep bite.

Posterior crossbite: A posterior crossbite was diagnosed when there was a crossover of at least one tooth in the posterior segment of the dental arch. A posterior crossbite could be unilateral (right or left) or bilateral.

Scissor bite: A scissor bite was considered to be present when the palatal cusps of the upper molars were positioned buccally in relation to the buccal cusps of the lower molars.

Crowding and Spacing: The crowding will be assessed by totaling the sum of slipped contacts measured in all segments. The lack of space not exceeding 2 mm was considered as no crowding, 2.1–4 mm as mild crowding, 4.1–7 mm as moderate crowding, and more than 7.1 mm as severe crowding. Surplus space in the dental arch exceeding 2 mm was considered as spacing.

Diastema: A midline diastema was considered to be present when there was a space of at least 2 mm between the maxillary central incisors.

Missing teeth: Missing teeth were counted and reasons for missing teeth were asked from the student and were recorded.

RESULT

Out of 93 students participating voluntarily, 63 were male and 30 female. The mean age was 21.52 years with the range of 18-26 years.

Among the total participants; normal occlusion was found in 9.68 %, whereas Angle's Class I malocclusion was found in 44.09 %, Class II in 30.1 % and Class III in 16.12 % (Fig.1). Among the various occlusal traits; normal overjet was present in 87.1 %, mild overjet in 2.2 %, moderate overjet in 8.6 %, and severe overjet in 2.2 % of the total
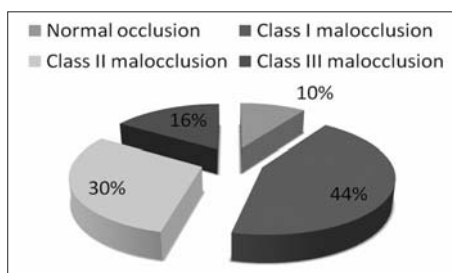
Fig 1. *Pattern of approximate distribution of malocclusion as per Angle's classification*
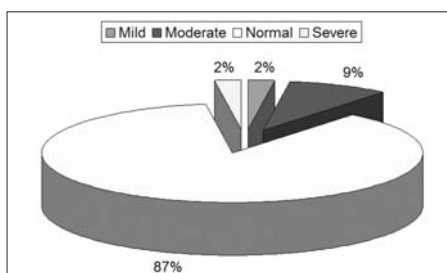

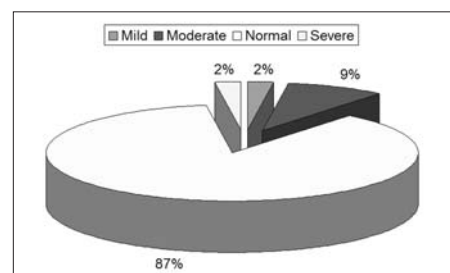**Fig 2.** *Distribution of range of overjet*

Fig 3. *Distribution of overbite*

participants (Fig 2). Similarly; normal overbite was present in 72.0 %, deepbite in 26.9 %, whereas openbite was present in 1.1 % of the total participants (Fig 3).

Scissor bite was present in 3.2 % of total participants, crossbite was present in 18.3 %; out of which 15.1 % had unilateral posterior crossbite, 3.2 % had bilateral posterior

crossbite and none had anterior crossbite. Spacing was present in 12.9 % of the total participants, 1.07 % had supernumerary teeth (paramolar) and none had midline diastema among the subjects studied (Table 1). Crowding was present in 51.5 %. It was observed that, there was more crowding in lower arch as compared to the upper arch (Table 2).

Table 1: Distribution of various occlusal traits			
Occlusal Traits	**No of students**	**Percentage**	**Scissor bite**
Scissor bite	Present	3	3.2
	Absent	90	96.8
Posterior Crossbite	Unilateral	14	15.1
	Bilateral	3	3.2
	Absent	76	81.7
Spacing	Present	12	12.9
	Absent	81	87.1
Supernumerary tooth	Present *(paramolar)*	1	

Table 2: Distribution of degree of crowding					
Arch	**Mild**	**Moderate**	**Severe**	**Total no.**	**Percentage**
Upper	8	5	3	16	17.20
Lower	18	16	11	45	48.39

DISCUSSION

The prevalence of malocclusion has been found to vary with different population, race and origin. The result of our study shows that 9.6 % has normal occlusion and 90.4 % has malocclusion. The prevalence of malocclusion in our study is higher than that of the study done by Usha Mohan Das et al [19] in school children of Banglore, India (71%), Faraj Behbehani et al [20] in adolescent Kuwaitis (86.3%), Emmanuel O. Ajayi[21] in school children of Nigeria (84.1%) and Nagaraja Rao[24] in school children of Udipi, Karnataka, India (28.8%) .

According to our study, Angle's Class I malocclusion is present in 44.09 %, Class II in 30.11 %, and Class III in 16.13 %. Hyng-Seon Yu et al [22] in South Korea studied the trend of malocclusion in patients attending orthodontic department and found Class I malocclusion in 33.3 %, Class II in 28.6% and Class III in 38.15%. The prevalence of Class III malocclusion is markedly different in our study which may be because of the racial predisposition to certain malocclusion. Sharma JN studied the patients coming for orthodontic treatment in Sunsari district of Nepal and found Class I malocclusion in 62.28 %; Class II malocclusion in 29.4 %, out of which the Class II Div 1 was 88.3 %

and Class II Div 2 was 11.6 %; and Class III malocclusion in 8.2 %.[16]

Among the medical students of IOM, normal overjet was found to be present in 87.1 %, which is higher than the finding of Faraj Behbehani et al[21] in adolescent Kuwaitis (53.2 %) and Ali Borzabadi Farahani et al[23] in urban Iranian population (67.7 %).

In the present study, the prevalence of deep bite is 26.9 % which is lower than the study done by Sharma JN[16] among orthodontic patients of BPKIHS of Sunsari district (40 %); Behbehani et al[20] in Kuwaiti adolescents (22%) and Ali Borzabadi-Farahani et al[23] in Iranian population (34.5 %). Similarly, unilateral posterior crossbite is found in 15.1 % and bilateral crossbite in 3.2 %; which is slightly less than the occurrence found by Behbehani et al[20] (unilateral crossbite 18.9 %, bilateral crossbite 6.3 %).

The crowding is present in 51.5 % which is similar to the study done by Sharma JN[16] (52.91 %). In our study, there is occurrence of more crowding in lower arch (48.39 %) as compared to upper arch (17.2 %); whereas Ali Borzabadi-Farahani et al[23] found crowding to be 37.2 % in maxillary arch and 32.7% in mandibular arch of Iranian population.

CONCLUSION

The prevalence of normal occlusion is 9.6 % and malocclusion 90.4 % in medical students of IOM, Nepal. Class I malocclusion is most prevalent followed by Class II malocclusion and the Class III malocclusion showed the least prevalence.

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