Prevalence of Malocclusion in Western Nepal

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ABSTRACT

Introduction: Malocclusion is the improper relationship of maxillary and mandibular teeth. The prevalence of malocclusion varies in different populations of the world.

Objective: To study the prevalence of malocclusion in western part of Nepal and to evaluate the gender variation in occurrence of malocclusion.

Materials & Method: A total of 1284 subjects were studied. Out of them 656 were male and 628 were female. Intra-oral examination was carried out to assess occlusal types of Class I, II, III according to Angle's classification of malocclusion, and various occlusal characteristics like crowding, spacing, cross-bite, open-bite and deep bite were recorded. Gender variation in malocclusion characteristics were tested using chi-square test ($p<0.05$).

Result: The present study showed that Class I occlusion type with malocclusion was more prevalent than Class II and Class III malocclusions. Class I was seen in 71.5% , Class II div 1 in 20.7%, Class II div 2 in 3.9% cases and Class III in 4.1% cases. Among the occlusal characteristics; crowding (61.3%), deep bite (29.5%) and spacing (10.5%) were most prevalent.

Conclusion: Class I malocclusion was most prevalent type of malocclusion in western Nepalese subjects. There was no significant gender dimorphism between male and female in prevalence of various malocclusion characteristics.

Keywords: gender variation, malocclusion, prevalence

INTRODUCTION

Malocclusion is the improper relationship of maxillary and mandibular teeth. It causes impairment of oral health, functions, esthetics and also affects the psychology of the individual. The prevalence of malocclusion varies among different populations of the world. This variation is attributed to genetic, racial and environmental aspects.[1-7] Nepal is a country with diverse ethnic population, culture, climate and environment. The distribution of different malocclusions in Nepal might be different from rest of the world. Hence the objective of the present study was to study the prevalence of malocclusion in western part of Nepal and to find out the variations in prevalence of malocclusion between male and female subjects.

MATERIALS AND METHOD

A cross-sectional study was conducted among 1284 individuals in Western region of Nepal. Out of them 656 were male and 628 were female. Samples were stratified into male and female strata.

Sample size was calculated as 969 using the formula: $N=4pq/L^2$.

[Where, p = prevalence rate obtained from previous study; [8] thus considered as 62.28%. q=1-p; L=permissible error in the estimation of 'p'. In this case; L=5% of 62.28 = 3.114]

However, due to availability of more number of samples, the present study was conducted among 1284 subjects.

Subjects of all age groups with complete permanent dentitions were included in the study. Subjects with grossly decayed teeth, having the history of tooth extraction and orthodontic treatment in the past were excluded from the study. People of different communities and ethnic groups like Brahmin, Chhetri, Magar, Gurung, Tamang, Rai, Limbu, Newar, Madhesi, Tharu etc residing in different districts of Western Region were studied.

Clinical examination was done on subjects who attended dental OPD's of hospitals, dental clinics, and those who attended school oral health program and community dental camps held in different parts of Western Region like Kaski, Tanahu, Lamjung, Gorkha, Syangja, Myagdi, Baglung, Parbat, Palpa and Nawalparasi districts. Intra-oral examination was carried out directly with the help of mouth mirror and probe. Examination was done by the author alone who served as the

Table 2- Pattern of maxillary canine impactions

Parameter		Total (N=1284)	Percentage (%)	Male (N=656)	Female (N=628)	*p*-Value
Occlusal type	Class I	919	71.5	489	430	0.28
	Class II div 1	266	20.7	123	143	0.31
	Class II div 2	51	3.9	30	21	0.36
	Class III	52	4.1	32	20	0.18
Occlusal characteristic	Crowding	787	61.3	401	386	0.16
	Spacing including midline diastema	135	10.5	65	70	0.28
	Anterior crossbite	81	6.3	46	35	0.43
	Posterior crossbite	45	3.5	26	19	0.48
	Open bite	114	8.9	63	51	0.54
	Deep bite	379	29.5	194	185	0.55
	Scissors bite	2	0.2	1	1	1.0

(Not significant p>0.05)

dental surgeon, it avoided inter-observer variation.

The subjects were assessed for occlusal types like Class I, II, III molar relation according to Angle's classification and various occlusal characteristics like crowding, spacing, crossbite, open bite, deep bite and scissor bite. The Class I category included both normal occlusion and malocclusion. The findings were recorded on a performa sheet.

The data were entered and statistical analysis was carried out using SPSS Version 16. Chi-square test was applied to test the significant difference as the data were in proportion (frequency percentage). The comparison was made between male and female samples for the variables of occlusal types (Angle's classification) and occlusal characteristics (crowding, spacing, crossbite, open bite, deep bite and scissor bite).

RESULT

Out of the total of 1284 western Nepalese subjects studied; the male to female ratio was 1.04:1. The age range was 13-63 years, and mean age was 38 years. The occlusal types according to Angle's classification of malocclusion and various occlusal characteristics are recorded in Table 1.

The present study showed Angle's Class I molar relation including normal occlusion and malocclusion was more prevalent than Class II and Class III malocclusions. Class I molar relation was found in 71.5%, Class II div 1 in 20.7%, Class II div 2 in 3.9% and Class III in 4.1% cases.

Crowding was seen more frequently than spacing. 61.3% of the total subjects had crowding where as 10.5% had spacing. Anterior crossbite occurred more frequently than posterior crossbite cases. Out of total samples, 6.3% subjects had anterior crossbite and 3.5% had posterior crossbite.

Likewise, deep bite occurred more frequently than open bite; 29.5% showed deep bite whereas 8.9% showed open bite. Scissor bite was found to be the least common occlusal characteristic which occurred only in 0.2% cases.

The present study showed no significant difference between male and female samples in occlusal types and occlusal characteristics studied.

DISCUSSION

The present report on malocclusion status and occlusal characteristics are comparable to other studies carried on Nepalese population. Shrestha BK *et al* reported malocclusion status of high school students in Kathmandu valley and found the prevalence of normal occlusion in 27% and malocclusion in 73%. In their study; Class I malocclusion was found in 59%, Class II in 25% and Class III in 16% cases.[9] Shrestha S and Shrestha RM analyzed malocclusion and occlusal characteristics in orthodontic patients of Kathmandu valley. They reported Class I malocclusion in 54.7%, Class II in 36.9% and Class III in 8.4%.[10]

Sharma JN reported prevalence of Class I, II and III malocclusions as 62.28 %, 29.4%.and 8.2% respectively in eastern Nepalese population. According to their study; the occlusal characteristics were: supernumerary teeth 2.9%, ectopic eruptions 7.1%, midline diastema 16%, incisor crowding 52.9%, spacing 30%, tooth malformations 3.1%, increased overjet 42.3% cases, anterior open bite

5.1% subjects, deep bite 40% and cleft lip and palate in 0.28% subjects.[8]

Silva and Kang found prevalence of malocclusion among Latino adolescents of USA. They found more than 93% of the subjects having malocclusion.[11] Among various studies on Caucasians; Krogman found the prevalence of malocclusion in 28%, 24.4% and 1.7% in Class I, II, III respectively and normal occlusion in 45.9% in children. Jackson and Brehm in the study among 6328 children and teenagers reported the prevalence of malocclusion as: normal occlusion in 16.6%, Class I in 60.1%, Class II in 22.8% and Class III in 0.5%. Emrich *et al* in the study on 13475 adolescents reported normal occlusion in 54%, Class I in 30%, Class II in 15% and Class III in 1%. Mills in the study among 1337 teenagers; reported normal occlusion in 17.5%, Class I in 72.2%, Class II in 6.6% and Class III in 3.7%. A study on 651 Indian-American children and teenagers aged 6-18 years; revealed normal occlusion in 34.6%; Class I in 53%; Class II in 9.5% and Class III in 2.9%. A study on 1700 Danish children and adolescents aged 9-18 years, reported normal occlusion in 14%, Class I in 58%, Class II in 24% and Class III in 4%.[1-5] A study on 398 men aged 21-25 years in Sweden reported the prevalence of malocclusion in 57%. In this study; crowding, increased overjet and open bite were found in 43%, 10%, and 8% cases respectively.[6]

Among the African samples, a study in 919 teenagers of 13-15 years in Kenya reported the prevalence of malocclusion was as high as 72%. In this study; crowding, increased overjet and open bite were found in 19%, 10%, and 8% cases respectively.[3]

Baral P reported a comparative study on prevalence of malocclusion among Aryan and Mongoloid races of Nepal. It was found that Class I molar relation was seen in 61.3% in Aryan and 64% in Mongoloid; Class II div 1 in 25.2% in Aryan and 17.9% in Mongoloid; Class II div 2 in 5.3% in Aryan and 2.5% in Mongoloid; Class III in 8.2% in Aryan and 15.6% in Mongoloid. Occlusal characteristics like crowding was seen in 46.6% Aryan and 48.1% Mongoloid; spacing in 9.9% Aryan and 8.7% Mongoloid; crossbite in 10.4% Aryan and 17.8% Mongoloid; open bite in 10.6% Aryan and 18.4% Mongoloid and deep bite in 34.9% Aryan and 29.8% Mongoloid. It was concluded that there was difference in distribution of malocclusion pattern among different Nepalese races.[12]

CONCLUSION

The prevalence of malocclusion in western Nepalese subjects is Class I in 71.5%, Class II div 1 in 20.7%, Class II div 2 in 3.9% and Class III in 4.1%. Crowding was seen more frequently than spacing, anterior cross bite cases were occurring more frequently than posterior cross bite cases and deep bite cases were more frequently occurring than open bite cases. Scissor bite was the least occurring occlusal characteristic. The present study showed no significant difference in gender dimorphism in prevalence and characteristics of malocclusion.

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