

# Prevalence of malocclusion in permanent dentition in Aryan and Mongoloid races of Nepal- A Comparative study

Prakash Baral<sup>a</sup>

## Abstract

**Introduction:** Malocclusion is defined as the improper relationship of maxillary to mandibular teeth. The prevalence of malocclusion varies among various populations because ethnic, genetic and environmental factors are the major contributors for the causation of malocclusion. The objective was to compare prevalence of malocclusion in Aryan and Mongoloid races.

**Material And Methods:** Total of 526 people (260 Mongolic and 266 Aryan), having malocclusion in permanent dentition were studied in this cross-sectional study. Multistage random sampling methodology was used. Intra oral examination was done in dental camps held in different parts of the country. Study subjects were made to sit on wooden chair and intra oral examination was carried out with help of mouth mirror, torch light and curve probe. Occlusal traits including class I, II, III, crowding, spacing, cross-bites, open bites and deep bites were recorded.

**Results:** Class I malocclusion was observed in 61.3% Aryan and 64% Mongoloid races, Class II division 1 malocclusion in 25.2% Aryan and 17.9% in Mongoloid races, Class II division 2 malocclusion in 5.3% Aryan and 2.5% in Mongoloid races, Class III malocclusion in 8.2% Aryan and 15.6% Mongoloid races, crowding in 46.6% Aryan and 48.1% Mongoloid races, spacing including midline diastema in 9.9% Aryan and 8.7% Mongoloid races, anterior and posterior cross-bites in 10.4% Aryan and 17.8% Mongoloid races, open bites in 10.6% Aryan and 18.4% Mongoloid races, deep bites in 34.9% Aryan and 24.8% Mongoloid races, missing teeth in 1.5% Aryan and 1.3% Mongoloid and supernumerary teeth in 0.6% Aryan and 0.7% Mongoloid races.

**Keywords:** Skeletal malocclusion; Cross bites; Crowding and spacing

## Introduction

Malocclusion is defined as the improper relationship between maxillary and mandibular teeth. The prevalence of malocclusion varies among various populations. This is blamed towards ethnic, genetic and environmental factors. Differences in malocclusion characteristics between different populations would be expected because of differences in racial and ethnic composition. The prevalence of malocclusion varies from one geographical area to another and differs from one country to another and even from one city to another. Different studies on different geographical locations have yielded different prevalence

rates of malocclusion.<sup>1-7</sup> The need for information regarding the prevalence of malocclusion in males and females in different age and ethnic groups has provoked many studies in this respect.

Knowledge about the distribution of different malocclusions may help orthodontic practitioners to better understand the existent problem in relevant geographic location and would help them in proper orientation and management of various treatments.<sup>1,2</sup> Hence the aim of the present study was to compare prevalence of malocclusion in Aryan and Mongoloid races.

## Material and Methods

A total of 526 people (260 Mongoloid and 266 Aryan) having malocclusion in permanent dentition were cross-sectionally sampled in this study. Multi-stage random sampling was

<sup>a</sup> Corresponding author; Associate professor, Department of Anatomy, B.P. Koirala, Institute of Health Sciences (BPKIHS), Dharan, Nepal. E-mail: prakashbaral2002@hotmail.com.

employed. Patients included in this study were between 15-30 years having permanent dentition, belonging to pure Aryan and Mongoloid races, having no history of extraction of permanent teeth, having no grossly decayed teeth and having parents and grandparents from the same race. Exclusion criteria were people below 15 years and above 30 years, people having history of extraction of permanent teeth and having grossly decayed teeth, the parents and grandparents of subjects having inter-cast marriage and people without malocclusion.

Intra oral examination was done on subjects who attended the dental camps held in different parts of country. Study subjects were made to sit on wooden chair and under torch light, intra oral examination was carried out with help of mouth mirror and curve probe. Occlusal types like class I, II, III, crowding, spacing, cross-bites, open bites and deep bites were recorded. Aryan race included the Brahmin, Chhetri, Baishna and Sudra casts where as Mongoloid race included Gurung, Rai, Limbu, Sherpa, Bhote, Tamang and Magar tribes.

## Results

In the present study class I malocclusion was observed in 61.3% Aryan and 64% Mongoloid; class II malocclusion division 1 in 25.2% Aryan and 17.9% in Mongoloid; class II malocclusion division 2 in 5.3% Aryan and 2.5% in Mongoloid; class III malocclusion in 8.2% Aryan and 15.6% Mongoloid; crowding in 46.6% Aryan and 48.1% Mongoloid; spacing including midline diastema in 9.9% Aryan and 8.7% Mongoloid; anterior and posterior cross-bites in 10.4% Aryan and 17.8% Mongoloid; open bites in 10.6% Aryan and 18.4% Mongoloid; deep bites in 34.9% Aryan and 24.8% Mongoloid; missing teeth in 1.5% Aryan and 1.3% Mongoloid and supernumerary teeth in 0.6% Aryan and 0.7% Mongoloid.

**Table: Distribution of various occlusal types**

S N	Occlusal types	Aryan% (n=266)	Mongoloid % (n=260)	P value
1.	Class I malocclusion	61.3	64.0	0.07
2.	Class II division 1 malocclusion	25.2	17.9	0.04*
3.	Class II division 2 malocclusion	5.3	2.5	0.02*
4.	Class III malocclusion	8.2	15.6	0.02*
5.	Crowding	46.6	48.1	0.08
6.	Spacing including midline diastema	9.9	8.7	0.08
7.	Anterior and posterior cross-bites	10.4	17.8	0.03*
8.	Open bites	10.6	18.4	0.03*
9.	Deep bites	34.9	24.8	0.03*
10.	Missing teeth	1.5	1.3	0.09
11.	Supernumerary teeth	0.6	0.7	0.09

(\*statistically significant  $p < 0.05$ )

There was significant difference ( $p < 0.05$ ) in distribution of malocclusion i.e. class II and III, cross-bites, open bites and deep bites between Aryan and Mongoloid races. Class II malocclusion and deep bites were observed significantly more ( $p < 0.05$ ) in Aryans where as class III malocclusion, cross-bites and open bites were observed significantly more ( $p < 0.05$ ) in Mongoloid people. Difference in distribution of class I malocclusion, crowding, spacing, missing teeth and supernumerary teeth were not significant ( $p > 0.05$ ) between the two races.

## Discussion

JN Sharma<sup>8</sup> reported prevalence of Class I, II and III malocclusions as 62.28 %, 29.4%. and 8.2% respectively. Out of 350 cases studied for various occlusal traits; absent teeth were 12.6%, supernumerary teeth were 2.9%, ectopic eruptions were 7.1%, midline diastema being 16%, incisor crowding representation of 52.9%, spacing in 30% cases, malformations 3.1%, increased over-jet

(>4mm) in 42.3% cases, anterior open bite in 5.1% subjects, deep bite (>4 mm) in 40 % and cleft lip and palate was prevalent in 0.28% subjects.

Rebeka G. Silva and David S. Kang found prevalence of malocclusion among Latino adolescents of USA. More than 93% of the subjects demonstrated some form of malocclusion in their study.<sup>9</sup> Krogman in his study on children between 6.5-12.5 years, found the prevalence of malocclusion as; normal occlusion being 45.9%; Class I, II, III being 28%, 24.4% and 1.7% respectively.<sup>1</sup> Jackson and Brehm in their study on 6328 children and teenagers reported the prevalence of malocclusion as follows: normal occlusion, 16.6%; Class I, 60.1%; Class II, 22.8% and Class III, 0.5%.<sup>1</sup> Emrich, Bordie and Blayney in their study on 13475 adolescents between the ages of 12-14, reported the prevalence of malocclusion as follows: normal occlusion, 54%; Class I, 30%; Class II, 15% and Class III, 1%.<sup>1</sup> Mills in his study on 1337 teenagers between the ages of 13-14, reported the prevalence of malocclusion as follows: normal occlusion, 17.5%; Class I, 72.2%; Class II, 6.6% and Class III, 3.7%.<sup>1</sup> A study on 651 Indian-American children and teenagers aged 6-18, revealed the prevalence of malocclusion as follows: normal occlusion, 34.6%; Class I, 53%; Class II, 9.5% and Class III, 2.9%.<sup>1</sup> A study in Denmark on 1700 children and adolescents aged 9-18, reported the prevalence of malocclusion as follows: normal occlusion, 14%; Class I, 58%; Class II, 24% and Class III, 4%.<sup>1</sup>

Another study on 919 teenagers in Kenya between the ages of 13-15, 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% of the cases respectively.<sup>3</sup> A study on 398 men in Sweden (aged 21-25), reported that the prevalence of malocclusion was as high as 57%. In this study crowding, increased over-

jet and open bite were found in 43%, 10%, and 8% of the cases, respectively.<sup>6</sup>

## Conclusions

There was a significant difference in distribution of malocclusion between Aryan and Mongoloid races. Such results are important for allocation of resources towards pertinent malocclusions. Furthermore emphasis on teaching, research and treatment modalities can be planned in line with the prevalent problems.

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