■ *Original Article*

PATTERN OF DISTRIBUTION OF MALOCCLUSIONS IN PATIENTS SEEKING ORTHODONTIC TREATMENT AT BPKIHS FROM SUNSARI DISTRICT OF NEPAL

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Abstract

Setting: College of Dental Surgery, B P Koirala Institute of Health Sciences, Sunsari, Nepal. **Aims:** To evaluate the pattern and distribution of malocclusions in patients seeking for orthodontic treatment from Sunsari district of Nepal. **Material and Methods:** Total of 350 patients who were permanent inhabitants of Sunsari district of age range 8-36 years were included in the study. A standard format was prepared to record the data. Descriptive statistics for mean, standard deviation and frequencies were calculated. Ages and Class I, II and III malocclusions were cross tabulated to check for any relationship using ANOVA. Intra investigator error was calculated using kappa statistics. **Results:** The prevalence of Class I, II and III malocclusions were 62.28 %, 29.4%.and 8.2% respectively. Out of 350 cases studied for various occlusal traits the nature of distribution of various occlusal findings were: absent teeth-12.6% ,supernumerary teeth-2.9% ectopic eruption-7.1%,midline diastema-16%, incisor crowding-52.9%, spacing-30%, malformations-3.1%, increased overjet (>4mm)- 42.3%, anterior open bite – 5.1% and deep bite (>4mm)- 40 % and cleft lip and palate was 0.28%. Most prevalent age group seeking orthodontic treatment was 12-24 years with females to male ratio of 2.3:1 Comparison of mean ages with different malocclusion groups using ANOVA was statistically not significant. **Conclusion:** Class I malocclusion was the most prevalent followed by Class II malocclusion and the Class III malocclusion showed least prevalence. There were diverse occlusal traits.

Keywords: Malocclusion, Angle's Classification, Sunsari, BPKIHS

Introduction

Study of the prevalence and pattern of distribution of malocclusion had been included in National Health surveys to derive valuable information to plan and develop the manpower and treatment facilities in Orthodontic specialty in many countries.[1-6] Although many studies have been reported on prevalence of malocclusion in different populations the review of literature showed that only few studies evaluated malocclusions in the referred population so as to plan and develop the treatment facilities based upon the pattern of the malocclusion and their frequencies of occurrences.[7, 8, 9]

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Although the need and demand for orthodontic treatment in Sunsari district is quite high there is no literature regarding the distribution pattern of malocclusion of this region.

Aims and objectives

To study the pattern of distribution of different malocclusions in the population of Sunsari district and compare the results with other population groups.

Material and methods

This cross sectional study was conducted in 350 patients (244 were females and 106 were males) at the Department of Orthodontics, College of Dental Surgery B P Koirala Institute of Health Sciences Dharan, Nepal after a written consent from all the

patients before conducting this survey and recording of the data. The age range of the sample was 8-36 years. All the patients were permanent inhabitants of Sunsari District of Eastern Nepal and none of the patients had undergone orthodontic treatment or suffering from any systemic diseases. A standard format was prepared in MS excel to record the data for various occlusal variables measured clinically and on dental casts. Alginate impressions were made and plaster casts were prepared as a supplementary measure to study the malocclusion. Localized tooth problems like absent teeth, supernumerary teeth, ectopic eruption, midline diastema, upper and lower incisor crowding, spacing, malformations like tooth anomalies, increased overjet, anterior open bite, deep bite, anterior cross bite, posterior cross bite , posterior open bite and cleft lip and palate were also studied and recorded.

The data prepared in MS excel sheet was analyzed using Statistical Package for social sciences for windows version 16 (SPSS Inc., Chicago, Illinois, USA). The significance level was set at $p<0.05$. To test the intra examiner agreement, 40 cases were re-examined one month after the initial examination and kappa statistics (Agresti1990) was used to check the intra examiner agreement. Mean ages and the Angle's Class I, II and III malocclusion were checked for any significant relationship using the test, the analysis of variance.

Results

Out of 350 patients, 244 were females and 106 were males. The mean age was 19.2 ±4.2 for males and 18.3 ± 5.1 for females. (Table1).

Table: 1 Age and gender distribution of the sample.

Gender	Frequency	Percentage	Mean age (Years)	SD
Males	106	30.3	19.2	4.2
Females	244	69.7	18.3	5.1
Total	350	100%	18.75	4.6

The age range was categorized as below 12 years, 12-24 years, 24-35 years and over 36 years to evaluate the age range having maximum interest for the treatment. The kappa value studied for the intra examiner variability was 0.620 indicating perfect agreement between the observations at two different times. Comparison of mean ages with malocclusion

groups as per Angle's classification using ANOVA was statistically not significant (Table 2). Most common age group seeking orthodontic treatment was 12-24 years with females to male ratio of 2.3:1.

Table 2: Statistical comparison of mean ages related to different malocclusion groups.

Class I (n=218)			Class II (n=103)			Class III (n=29)		
Mean	SD	p value	Mean	SD	p value	Mean	SD	p value
18.5	4.3	0.79	17.4	3.2	0.64	16.5	7.1	0.29

Class I malocclusion was 62.28%(218) out of which Dewey's modification Type 1(crowding) was 70.18 %(153), Type 2 (proclination) was 20.18%(44), Type 3 (anterior cross bite) was 5.04 %(11), Type 4 (posterior cross bite) was 3.21 %(7) and Type 5 (mesial migration) was 1.37%(3).Class II malocclusion was 29.4 %(103) out of which the Class II Div 1 malocclusion was 88.3%(91)and Class II Div 2 was 11.6%(12). Class III malocclusion was 8.2 %(29)(Fig.1).
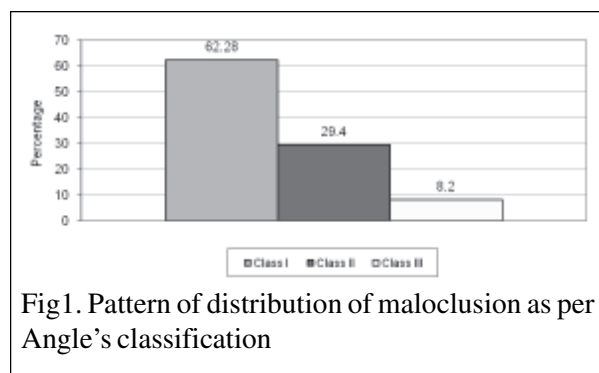

Fig1. Pattern of distribution of maloclusion as per Angle's classification

Out of 350 cases studied for various occlusal traits the nature of distribution of various occlusal findings were: absent teeth-12.6% (44),supernumerary teeth-2.9% (10), ectopic eruption-7.1% (25), midline diastema -16% (56), upper and lower incisor crowding-52.9.1% (185), spacing-30.% (105), malformations-3.1%. (11), increased overjet (>4mm)-42.3% (148), anterior open bite – 5.1% (18),deep bite (>4mm)was 40% (140),anterior cross bite 12.9%(45),posterior cross bite 3.7%(13), posterior open bite 0.3%(1) and 0.28 %(1) case was having cleft lip and palate (Fig.2).
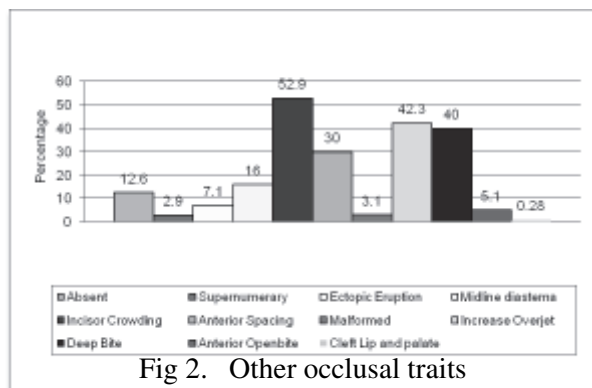
Fig 2.   Other occlusal traits

Discussions

The prevalence of malocclusion had been found to vary with the different population, race and origin. This type of study might help in planning an orthodontic patient service based upon the need and the pattern of distribution of the malocclusion in the Sunsari district of Nepal.

Evaluation of malocclusion among the referred cases for orthodontic treatment for people of Sunsari district had not been reported in the literature.

Sayin[8] studied 1356 patients referred to department of Orthodontics, Suleyman Demirel University, Turkey and found 64 % Class I malocclusion, 19% Class II malocclusion and 12% class III malocclusion. When compared to the present study the prevalence of class I malocclusion was higher but the prevalence of class III malocclusion was markedly less. The difference could be due to the variation in the sample size and racial predisposition to certain malocclusions. Sari [9] evaluated 1602 patients in the Department of Orthodontics, Selcuk University, Turkey and showed that 61.7 % patients had class I malocclusion, 25.1% had class II division 1 malocclusion, 3.15 % had class II division 2 malocclusion and 10.2% had class III malocclusion. The frequency of Class I malocclusion was slightly lesser than that of the present study but the Class III malocclusion was considerably higher. The difference in the sample size, ethnic variation for malocclusions between these two races with higher prevalence of Class III malocclusion in Turkish population might be related to the differences in the results.

Lew et al[10] in 1050 Chinese children reported 7.1% as normal occlusion, 58.8% as Class I malocclusion, 18.8% as Class II, division 1 malocclusion, 2.7% as Class II, division 2 malocclusion and 12.6% as Class III malocclusion. The prevalence of class III malocclusion in Chinese children was found more than the Nepalese sample however other groups of malocclusions were similar.

Proffit et al[11] studied the data from the NHANES III survey (USA) and reported that   30%   had Angle's normal occlusion, 50% had Class I malocclusion, 15% had Class II malocclusion and 1% had Class III malocclusion. Higher prevalence of Class II and class III malocclusion in Nepalese population than that of American population could be related to non availability or scanty orthodontic treatment facilities in Sunsari district and higher genetic predisposition[12, 13] to Class I and Class III malocclusion in Nepalese population.

Study of individual tooth problems showed that there was frequent occurrence of congenitally missing teeth (12.6%) involving mainly maxillary and mandibular lateral incisors. The prevalence of supernumerary teeth (2.9%) predominantly in the form of mesiodens in the maxillary arch was common. Ectopic eruption of teeth involving maxillary canines, lateral incisors and lower premolars comprised of 7.1 % in the present sample. It could be because of lack of guidance of eruption and preventive orthodontic therapy in the region or due to arch length tooth size discrepancy.[14] Midline diastema mostly associated with fibrous frenum was 16 %. The malformed teeth comprising of peg shaped laterals was 3.1%. The anterior open bite was 5.1 %, the deep bite cases were 40 % and increased overjet was 42.3%.There was one case (0.28%) of cleft lip and palate in the sample under orthodontic treatment noted.

Age range of 12-24 years showed highest frequency of malocclusion than other groups among which females (69.7%) seeking orthodontic treatment were approximately twice than the males (30.3 %).This could be related to the increased parental concern or higher self consciousness for esthetics in younger age group. Increased response of the females when compared to males could be because of higher esthetic concern of girls than boys and also due to social or matrimonial reasons.

Conclusion

·   Most commonly enecountered malocclusion was Class I followed by Class II and Class III.
·   Age group 12-24 years showed highest frequency with females twice more than the males.

· Congenitally missing teeth, ectopic eruptions, cross bites and open bites were frequent occlusal traits seen in this population group.
· A nationwide survey with well distributed sample size considering different ethnic groups of Nepal is recommended for planning orthodontic services for the people of Nepal.

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