Prevalence of skeletal malocclusions among Kanpur population: A cross sectional study

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Abstract

Introduction: This study is aimed at investigating the prevalence of type of malocclusion among patients referred to Department of orthodontics, Rama dental college, hospital and research centre, Kanpur Uttar Pradesh India during January 2018 to March 2019.

Materials and methods: A cross-sectional survey was conducted among 528 patients and all these data were collected from patients admitted during the period of march 2018 to 2019. Classification of dental occlusion in patients was based on Angle's definition; skeletal malocclusion classification was based on Steiner's analysis, and Wits appraisal and Beta angle values.

Result: Among528 patients, 306 are female and 222 were male, class I malocclusion was 31.25 %, class II was 57.3% and class III 11.5%. The highest percentage was of Class II with a 57.3 % rate and the lowest recorded malocclusion was Class III. Malocclusion Class II was recorded twice in females compared to males. On the basis three parameters, the prevalence of Beta angle was the highest with 66.1% in Class III Malocclusion.

Conclusion: According to this study the most common skeletal malocclusion was class II malocclusion among male and female both and the least was class III and mostly females were affected with malocclusion. Amongst the three parameters, the prevalence of Beta Angle in Class I Malocclusion Female was the highest, followed by Wits appraisal and ANB angle and in Class II Malocclusion; the prevalence of Wits in female was the highest. In Class III Malocclusion, the prevalence of Beta angle was the highest.

Introduction

Dental malocclusions are considered to be one of the most prevalent dental problems even in developed countries.[1-3]Various attempts to treat these conditions have been recorded in history, and now it has become a specialized field in Dentistry. For this reason, people from all over the world have an awareness of this issue and people like to give importance to their appearance regarding teeth. An acceptable and good facial/dental esthetic is very important among young and they are mostly influenced by the surrounding culture, internet and social blocks, which is increasing day by day. An effective and sure concern is required to start an orthodontic treatment for a proper well-being.[4] Social interactions that have a negative effect on self-concept, career advancement, and peer-group acceptance have been associated with unacceptable dental appearance. The public equates good dental appearance with success in many pursuits.[5] A malocclusion is defined as an irregularity of the teeth or a malrelationship of the dental arches beyond the range of what is accepted as normal. Malocclusion can lead to different problems in individuals like mental and social issues due to the impact on beauty then disruption in the normal mouth function, temporomandibular joint dysfunction, and eventually gum disease and tooth decay. However, still malocclusion is not considered to be a dental problem instead more priority is given to the treatment of dental caries and periodontal diseases due to pain experienced by them. Awareness lacks in the rural people regarding advances and various techniques in orthodontic treatment, though people are concerned regarding their facial appearance, lack of awareness regarding this field makes them unapproachable to an orthodontist.[6] The prevalence of malocclusion in adults is a complex case that may be due to relapse of orthodontic treatment, dysfunctional treatment of

childhood, loss of teeth, or as a result of occlusive changes over time.[7] Detailed knowledge of prevalence of this anomaly is a primary step to judge a better treatment plan and options. A study carried in Karnataka state on 2600 subject showed that 87.79% of population had malocclusion. Out of which 89.45% had class I, 8.37% had class II, and 2.14% had class III malocclusion.[8] In a similar study in Rajasthan state on 700 subjects shows that 66% of population have malposed teeth.[9] Similar studies were carried out in different countries in which their results are different. Depending upon the environmental, genetic factors and role of geographic areas difference in distribution and prevalence of malocclusions in different areas have been reported.[10]

Materials and Methods

This study is retrospective and cross-sectional and the target population comprises all patients referred to the orthodontic department of Rama dental college, hospital and research centre during the time period of 2018 to March 2019.A total of 528 patients were involved in this study (222 male and 306 female). All patient's information was extracted from the history record (Lateral cephalometric analysis) of Department of Orthodontics, Rama dental college hospital and research centre and categorized into 4 norms 1) age, 2) gender, 3) Steiner's ANB angle, 4) Wits appraisal, and 5) beta angle. The inclusion criteria included that none of the subjects had previously undergone orthodontic treatment; Subjects age range between 9-27 were selected. The exclusion criteria were patient with primary dentition, patient age more than 27 years, subjects who have not started orthodontic treatment.

Statistical Analysis:

The data was entered in MS-Excel and STATA 14.2 software was used for statistical analysis. The prevalence of malocclusion was reported by gender and in total. The chi-square test was applied to determine the statistical associations between the independent variables and the malocclusion variable. The reporting of prevalence of Malocclusion was done in percentages and frequency. The clinical registrations were based on the method evolved by the Angle's classification.

Results

The present study had 528 participants, divided in three groups where 31.2% had Class I Malocclusion, 57.3% had Class II Malocclusion and 11.5% had Class III Malocclusion (Table 1). The mean age of the sample was 17.6 ±4.3 years and there were 42% male while 58% were female. The study showed that amongst the three parameters, the prevalence of Beta Angle in Class I Malocclusion Female was the highest with 57.1% followed by Wits (53.6%) and ANB (53.1%) as given in Table 3. In Class II Malocclusion, the prevalence of Wits in female was the highest with 57.6%. In Class III Malocclusion, the prevalence of Beta angle was the highest with 66.1%.

Table 1: Distribution of participants in the groups

Group	Frequency (n)	Percentage
Class I Malocclusion	165	31.2%
Class II Malocclusion	303	57.3%
Class III Malocclusion	60	11.5%
Total	528	100.0%

Table 2: Age and Gender Distribution in each participant

Group	Frequency	Age (Years)	Gender n (%)		*p**
	n	Mean ±SD	Male	Female	
Class I Malocclusion	165	17.8 ±4.7	73 (44.2 %)	92 (55.8%)	0.429
Class II Malocclusion	303	17.5 ±4.3	128 (42.2 %)	175 (57.8%)	
Class III Malocclusion	60	17.7 ±4.2	21 (35.0 %)	39 (65.0%)	
Total	528	17.6 ±4.3	222 (42.0 %)	306 (58.0%)	

* *P-value* was obtained using chi-square test on gender and malocclusion variables

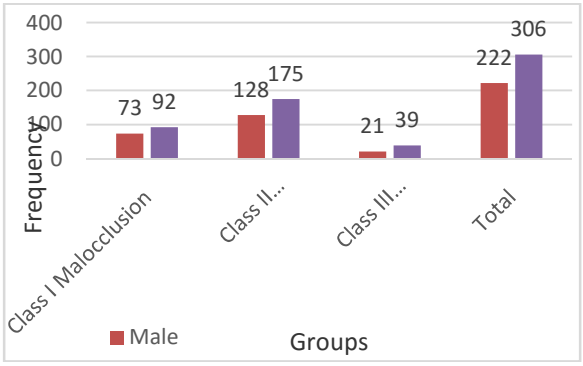

Figure 1: Gender distribution of participants in each group

Table 3: Prevalence of Malocclusion in Male and Female participants as per various parameter

Parameters	Total n (%)	Male n (%)	Female n (%)
ANB (◦) • Normal (Class I) • Increased (Class II) • Decreased (Class III)	147 (89.1%) 294 (97.0%) 60 (100%)	69 (46.9%) 126 (42.8%) 21 (35.0%)	78(53.1%) 168 (57.2%) 39 (65.0%)
Wits (mm) Male • Normal (Class I) • Increased (Class II) • Decreased (Class III)	62 (37.5%) 276 (91.1%) 58 (96.6%)	31 (50.0%) 118 (42.7%) 21 (36.2%)	. . .
Wits (mm) Female • Normal (Class I) • Increased (Class II) • Decreased (Class III)	41 (24.8%) 295 (97.3%) 53 (88.3%)	. . .	22 (53.6%) 170 (57.6%) 34 (64.1%)
Beta Angle (◦) • Normal (Class I) • Increased (Class II) • Decreased (Class III)	128 (77.5%) 273 (90.1%) 53 (88.3%)	55 (42.9%) 118 (43.2%) 18 (33.9%)	73 (57.1%) 155 (56.8%) 35 (66.1%)

Discussion

In a normal occlusion tooth are beautifully and regularly placed in the arch which can only be seen only in the prosthesis according to the theoretical aspect. Normal occlusion doesn't mean anything but terms of beauty and performance, it should be desirable for community and without any damage to the periodontium. Malocclusion also refers to an incorrect pairing between upper and lower maxilla between dental arch which can lead to such problems like loss of function, loss of beauty, temporomandibular problems, and periodontal diseases.[11,12] Based on the results of this study, skeletal Class II malocclusion (57.3%) is considered as the most common skeletal malocclusion, among patient inflow in the orthodontic department during the mentioned time period which was almost more than half of the entire under-studied people, and majority of patient were female. Prevalence of other dental malocclusions in this research is as follows: class II (31.2%), class III (11.5%). Among the three parameters, the prevalence of Beta Angle in Class I Malocclusion Female was the highest with 57.1% as compared with male 42.9 % followed by Wits (53.6%) and ANB (53.1%) in females and 50.0%, 46.9% this study was consistent with the previous studies done by Bhavna Kaul [13] results showed that 82.9% of the subjects had malocclusion. He had done this study to determine the prevalence of different types of malocclusion based on Angle's classification in Jammu. Among 696 subjects were 369 males and 327 females between the age group of 13-14 years. The malocclusion determination was based on the Angle's classification of malocclusion. Class I malocclusion constituted the major proportion of malocclusion, which was found in 66.9% of the studied population. Class II Division I constituted 8.3% of the sample size. Class II Division II constituted 5.9% of the sample size. Class III constituted 1.8% of the total sample size. However, results of few of the studies as done by Rao et al.14he reported a low incidence of malocclusion are in disagreement with the results of our study.

Conclusion

The most common dental malocclusion among patients was skeletal class II malocclusion, among class I,class II, class III skeletal malocclusion where class III had the least prevalence and also there was a significant gender difference among all this pattern. Amongst the three parameters, the prevalence of Beta Angle in Class I Malocclusion Female was the highest, followed by Wits appraisal and ANB angle and in Class II Malocclusion; the prevalence of Wits in female was the highest. In Class III Malocclusion, the prevalence of Beta angle was the highest. It was also concluded that patient in Kanpur zone are more willing for orthodontic treatment who have skeletal class 2 pattern or with proclined upper incisors compared to class 1 and class III.

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