

PREVALENCE OF MALOCCLUSION IN PATIENTS REPORTING IN AN ORTHODONTIC OPD OF A TERTIARY CARE HOSPITAL

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ABSTRACT

Introduction: Malocclusion can present itself in numerous ways. It is present in every society but the norms and pattern vary. In order to correct occlusal disharmony, it is imperative to identify its pattern in the population so that proper resources can be directed towards its diagnosis and treatment planning. **Objective:** The purpose of this study was to assess the pattern of malocclusion in patients of the Department of Orthodontics at Altamash Institute of Dental Medicine. **Materials and Methods:** To achieve this, dentofacial characteristics of 324 patients from September 2003 to November 2008 were analyzed and tabulated. Both males and females were included in this study. Different cephalometric values were used to evaluate the type of malocclusion. Casts were analyzed to record the patients dental classification. **Results:** Skeletal class II was the most frequently seen malocclusion in this population whereas class III was least frequently seen. Class II molar relation was the most prevalent. The study also revealed the amount of overjet mostly seen in class II patients. **Conclusion:** The results of this study reflect the need for further studies to investigate the reasons behind this trend.

Key words: Malocclusion, Occlusal features, Orthodontic patients.

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INTRODUCTION:

Malocclusion is a term usually used to describe deviations in intramaxillary and/or intermaxillary relations of the teeth and/ or jaws. It describes a spectrum of deviation from the normal or ideal to very severe anomalies. Etiology of malocclusion is multifactorial, both genetic and environmental factors play their roles. It occurs in majority of population therefore detailed knowledge of its dental and skeletal characteristics is essential so that proper resources can be directed towards its diagnosis and treatment planning.

Different studies on the prevalence of malocclusion in various ethnic groups have been conducted. There is a high

incidence of Class I malocclusion in White Americans (Class I 52.5%, Class II 42.4% & Class III < 5%). Class I malocclusion is also more prevalent in Black Americans (Class I 71%, Class II 16% & Class III 8.4%). In Nigerians, Class I malocclusion is most prevalent being 74%. Another study showed Class III malocclusion to be more frequent in Oriental populations (3–5% in Japan and nearly 2% in China with another 2–3% being pseudo Class III), whereas Class II problems are more prevalent in whites of northern European descent. The most common type of malocclusion in Saudi Arabian population is Class I (69.3%), followed by Class II division 1 (12.2%), Class III (9.8%), Class II division 2 (5%) and pseudo Class III (3.7%).

There are large number of classifications and indices which are used to record the prevalence of malocclusion within a population. They also help in the assessment of need, difficulty and success of orthodontic treatment. Angle's classification is valuable in assessing the dental component of malocclusion. It describes antero-posterior relationship of the maxillary and mandibular first molars during maximum intercuspation. Cephalometric indicators are used to analyze the maxillary and mandibular skeletal positions. Both angular and linear measurements have been proposed in the assessment of anteroposterior jaw-base relationship.

The purpose of this study was to analyze and provide quantitative information on the pattern of malocclusion in patients coming to the Department of Orthodontics at Altamash Institute of Dental Medicine.

MATERIALS AND METHODS

A retrospective study was conducted on 275 patients who visited the Orthodontics Department of Altamash Institute of Dental Medicine from September 2003 to November 2008. Information regarding age and sex was obtained from the patient's record files. Both males and females were included in this study.

The inclusion criteria used to select the sample were:

- Patients having orthodontic casts taken in centric occlusion with trimmed and symmetrical bases.
- Patients having lateral cephalometric radiographs taken in natural head posture.
- Presence of OPG
- Presence of first permanent molar.
- Patients with no significant past medical history
- Patients with no history of trauma
- Patients with no previous orthodontic treatment
- Patients with no previous prosthodontic treatment
- Patients with no history of maxillofacial or plastic surgery.

Cephalometric landmarks were marked on each cephalogram. The identification was based upon classical definitions given in literature.

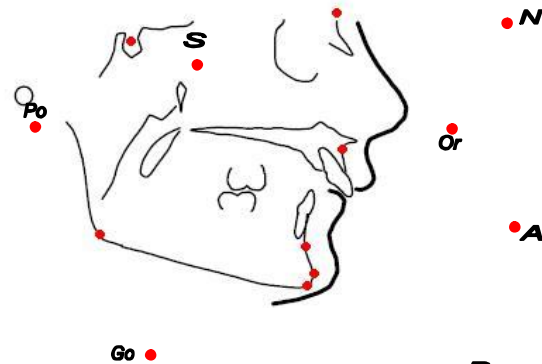


Figure-1: S=Sella; N=Nasion; Po=Porion; Or=Orbitale; A=Point A or subnasale; B= Point B or subspinale; Pg= Pogonion, Gn= Gnathion & Go= Gonion

Following planes were used in this study:

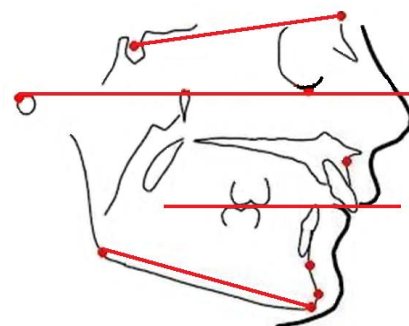


Figure-2: SN plane; Frankfurt horizontal; Occlusal plane; Mandibular plane

The angular measurements used were:

SNA: 80-84 degrees: Orthognathic Maxilla

<80 degrees: Retrognathic Maxilla

>84 degrees: Prognathic Maxilla

SNB: 78-82 degrees: Orthognathic mandible

< 78 degrees: Retrognathic mandible

> 82 degrees: Prognathic mandible

ANB: 0–4°: Skeletal class I
 >4°: Skeletal class II
 <0°: Skeletal class III

Linear measurements taken were:

Witts Appraisal:

➤ **Male**

Class I: -3 to +1,

Class II: > +1,

Class III: < -3

➤ **Female**

Class I: -2 to +2,

Class II: > +2,

Class III: < -2

McNamara Analysis:

➤ *Mc-A:*

0-2 mm: Orthognathic Maxilla

> 2 mm: Prognathic Maxilla

< 0 mm: Retrognathic Maxilla

➤ *Mc-Pog:*

-7 to +1mm: Orthognathic Mandible

> +1mm: Prognathic Mandible

< -7mm: Retrognathic Mandible

Casts were analyzed in occlusion to record occlusal components such as angle's classification for molar relationship and incisor classification.

Molar Class I: Mesio Buccal cusp of the upper first molar occluded with the mesio Buccal groove of the lower first molar within the range of less than half a cusp width anteriorly or posteriorly.

Molar Class II: Mesio Buccal cusp of the upper first molar occluded anterior to the Class I position.

Molar Class III: Mesio Buccal cusp of the upper first molar occluded posterior to the Class I position.

Incisors were classified according to British Standard Institute (BSI) of incisor classification.

Class I— the lower incisal edges occlude with or lie immediately below the cingulum plateau of the upper incisors.

Class II— the lower incisor edges lie posterior to the cingulum plateau of the upper central incisors.

Division 1- the overjet is increased, and the upper central incisors are proclined.

Division 2- the overjet is minimal or increased with retroclined upper central incisors.

Class III— the lower incisor edges lay anterior to the cingulum plateau of the upper central incisors. The overjet is reduced or reversed.

The data was analyzed using Microsoft Office Excel 2007.

RESULTS

The distribution of malocclusion types for the total sample according to incisor classification was 22%, 70%, 6%, and 2% for Class I, Class II/1, Class II/2, and Class III, respectively, as shown in Figure 3.

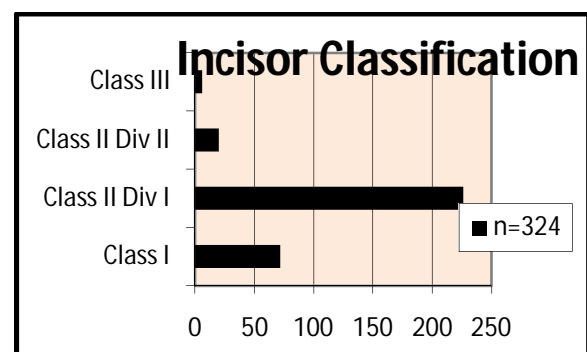


Figure-3: Incisor Classification

Figure 4 shows the distribution of overjet. 16% of the total sample had an overjet of 1-2 mm, which could be regarded

as normal anteroposterior incisor relationship, 20% had overjet between 3-4 mm, regarded as mild and 29% had moderate overjet of 5-6 mm. About 25% of the total sample had overjet greater than 7 mm that could be considered as severe and potentially handicapping.

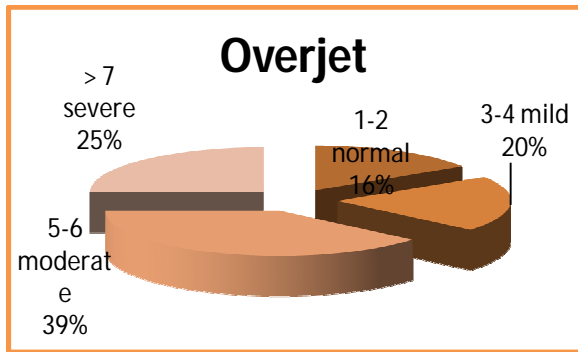


Figure-4: Overjet

Figure 5 shows the Angle's molar relationship of the total sample. Class II molar relationship was the most prevalent followed by Class I and III for both right and left sides.



Figure-5: Angle's Classification

Figure 6 shows the Skeletal classification of the total sample. Skeletal class II was the most prevalent with 56% of the patients following into this category, followed by class I (40%) and class III (4%).

Figure 7 shows that skeletal class II relationship in most of the patients included in the sample was mostly because of

mandibular retrognathism (75%) and a relatively small percentage showed maxillary prognathism (25%).

No significant gender differences were found.

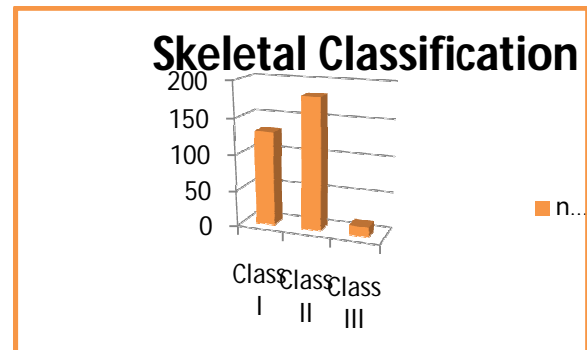


Figure-6: Skeletal Classification

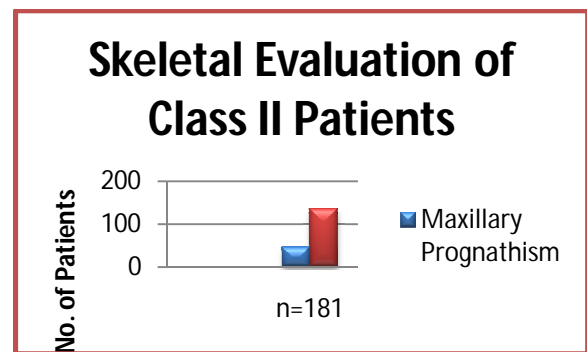


Figure-7: Skeletal Evaluation of Class II Patients

DISCUSSION

This investigation studied the dentoskeletal characteristics of patients visiting Orthodontic Department of Altamash Institute of Dental Medicine using lateral cephalometric radiographs and dental casts.

The present study confirmed that predominant anteroposterior skeletal relationship is Class II malocclusion, with no significant gender differences. The analysis of skeletal morphology was based on cephalometric variables. Our study like many others demonstrated that in majority of Class II division 1 cases, malocclusion was determined by mandibular retrognathism.

Angle's Class II (65%) and Incisor Class II Division 1 (70%) were the most frequent pattern of malocclusion found in the sample. Although Angle's classification is limited, it does not incorporate vertical and transverse abnormalities. It is a universally accepted system that is reliable, repeatable and it minimizes examiner subjectivity.

This was a pilot study and does not necessarily reflect the trend of the entire Pakistani population. Result of this study was in agreement with the studies reported by Gulerum and Ijaz, also Hameed reported skeletal Class II as the most common antero-posterior pattern of malocclusion. On the other hand Shehzad and Afzal reported Angle's Class I as the most frequent pattern of malocclusion. The differences between the prevalence of malocclusion might be related to the racial differences and the setup in which they were conducted.

The clinical implication from this finding could mean that the orthodontic management of Class II malocclusion would be more commonly encountered in Pakistani community. Extraoral traction of maxilla is necessary in midface prognathism and in case of mandibular retrognathism treatment should focus on optimizing mandibular growth with functional jaw orthopedic appliances.

The epidemiological data on the prevalence of malocclusion is an important determinant in planning appropriate levels of orthodontic services and further studies are required to provide accurate estimates of the orthodontic treatment need in Pakistani population.

CONCLUSIONS

The study showed that angles class II malocclusion was most frequently seen, whereas class III was the least frequent. The study also revealed the variation in skeletal morphology in skeletal class II patients with most of them having a retrognathic mandible as compared to a prognathic maxilla. This was a pilot study and does not necessarily reflect the trend of the entire Pakistani population. It however does provide a base line data for planning orthodontic treatments. It also reflects the need for further

studies in this regard so that the pattern of malocclusion in patients from different ethnic backgrounds can be also be evaluated.

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