ORIGINAL ARTICLE

CORRELATION OF SAGITTAL RELATIONSHIP ON CAST AND CEPHALOMETRY: A STUDY

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ABSTRACT

The aim of the study was to investigate the correlation of the ANB angle and the molar relationship among Orthodontic Patients in Peshawar Dental College using dental casts and cephalometric radiographs of 184 patients. The dental casts for molarrelationshipaccording to Angle's classification were recorded. Cephalogram were analyzed for ANB angle and Witt's Appraisal. All statistical analyses were performed using SPSS 20 software. Statistical significance was predetermined at the 95% level ($p<0.05$). Of total 184 patients 124 were females and 60 were males.Class I malocclusion showed the most prevalent group. There was a definite and statistical significant correlation between ANB and Wits value (.355). While the correlation between dental (angle classes of molar) and skeletal ANB and WITS was weak and statistically non significant.

Key Words: *Skeletal malocclusion, Dental malocclusion, Sagittal plane.*

INTRODUCTION

An ideal occlusion is hypothetical concept rarely found in nature. It applied to conceptwhen proper skeletal bases of maxilla and mandible and teeth are of correct size and should be in the correct relationship in all three planes of space at rest and can be used to judge Aesthetic and Functional aspects of other malocclusions.[1-2]Therefore an accurate dental and skeletal jaw base measurement is critically important in orthodontic diagnosis and treatment planning.[3] Different diagnostic records are used nowadays to achieve optimal and correct treatment plan.[4]

Studies are conducted to investigate the correlation between dental and skeletal malocclusion. The earliest published method of recording and classifying malocclusion on Cast was Angle's classification in 1899,[5] Itis based on the correctrelationship of first permanent molar as its position remains constant following eruption and it is based when mesiobuccal cusp of maxillary first molar occlude with the buccal grove of mandibular first molar.[6] It is an easy method of assessing malocclusion on the study cast but it is the representative of only the dental classification in sagittal plane. Since the beginning of 1900s century the relationship between the maxilla and the mandible was considered a good tool in studying the growth pattern of skeletal discrepancies.[7] After the introduction of lateral cephalogram its very important in determining the skeletal problem includinganteroposterior position of the jaws relative to each other which is important in treatment planning and especially in deciding whether orthodontic treatment alone or in combination with surgery is required.[8]The first and most commonly used angle for determining the skeletal jaw disharmony in sagittal plane is ANB angle. However ANB angle has few limitations, So WITS analysis was developed to overcome the drawbacks of ANB angle.[9]

However, more research is needed to evaluate any correlation between dental and skeletal anteroposterior relationship.In the present study, an attempt wasmadeto investigate the correlation of the ANB angle with molar malocclusion which will help the Orthodontist to realize the individual importance of Cast and Cephalometric analysis in efficient treatment planning.

The Objective of this Study was to determine the correlation of the skeletal (ANB angle) with dental (molar)malocclusion in the anteroposterior plane.

MATERIALS AND METHODS

This descriptive cross-sectional study was carriedout at the Department of Orthodontics, Peshawar Dental College.From a total of 400 records we selected 184 cephalograms and casts andwere included in this study by convenient sampling technique. The inclusion criteria were patients with full set of permanent teeth, having all three types of dental and skeletal malocclusion and the availability of their Pre-treatment lateral

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Cephalogram.

The exclusion criteria were patients with heavy fillings in their teeth,presence of superneumary teeth, history of previous orthodontic treatment,drifted molarsand premolars, cleft and lip patients, Para functionalhabits and patients withany prosthetic restorations.

Patient's molarrelationships wereanalyzed on the existing Cast according to Angle's classification. The ANB angle and Witt's were assessed on cephalogram for each patient. The collected data was analyzed with the help of SPSS for window version 20. Correlation was established with the help of bivariate co relation test. Molar bar chart was used to determine the frequency of malocclusion. P value<0.05 was considered significant.

RESULTS

From the 184 cases that were investigated in the present study, there were 124 females and 60 males. Details are given in Figure1. Class I shows the most prevalent group in the study as shown in Figure2. Overall, non-significant negative correlation exists between Molar and ANB or WITTS analysis which shows that there is a weak correlation between dental and skeletal malocclusion, while positive association exists between ANB angle and WITTS analysis. Details are given in Table 1

DISCUSSION

In analysis and management of orthodontic case, it's not only enough to treat the dental malocclusion but correction of skeletal relationship is also important in obtaining harmonized and well proportionate face after orthodontic treatment. Because Modern society has placed a strong emphasis on physical attractiveness, it is common now to hear that treatment goals should be to achieve an overall facial balance.[10] Also currently malocclusion is one of the most common problem ranking third among worldwide dental public health priorities associated with oral dysfunction, periodontal problems as well as psychological problems with disturbed quality of life.[11] Many parameters are designed to determine the anteroposterior relation.In this study we used ANB angle formeasuringsagittal jaw discrepancy but it also has several limitations but Witt's APPRAISAL is another alternative introduced by Jacobson for assessing skeletal discrepancy. Similarly for dental relationship most widely Angle's classification is used. Both classifications are necessary to be considered in every treatment planning by the orthodontist for excellent treatment outcomes.

Different studies conducted to determine the correlation between dental and skeletal malocclusion and it was assumed that they are highly correlated

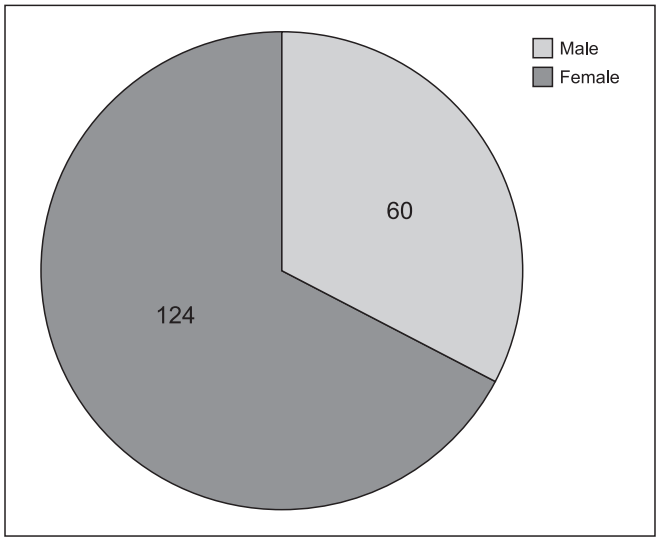

Fig 1: Gender Distribution

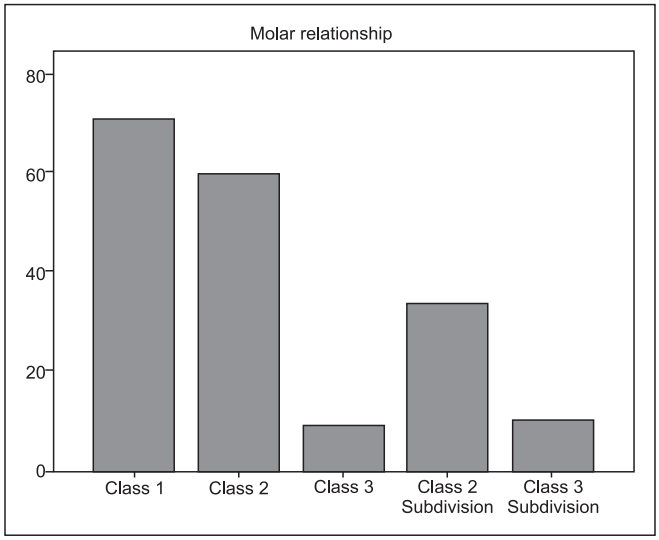

Fig 2: Frequency of Molar Relationship

TABLE 1: CORRELATION BETWEEN DENTAL AND SKELETAL MALOCCLUSION

	Dental & Skeletal Malocclusion	N	Correlation
1	Molar relationship & ANB angle	184	-.135
2	Molar relationship & WITTS analysis	184	-.094
3	ANB angle & WITTS analysis	184	.355

but there is poor relation between them. Therefore, in our study we correlate the Dental malocclusion with the skeletal malocclusion to strengthen the evidence based on population study. In this study we selected 184 Casts and Cephalograms from Patient records based

on molar relationship and ANB and Witt's Analysis. From 184 subjects there were 67% of females and 32% of males which included 38.6% Class I, 32.6% Class II, 4.9% Class III, 18.5% Class II subdivision I, and 5.4% Class III Subdivision I. Among them Class I was the most common group of malocclusion in our region. Furthermore, our result show no significant association between molar classes and ANB angle nor with WITS appraisalAlthough association between ANB angle and WITS appraisal was strong and positively significant (.355). Our result was in agreement with AL- Hamlan et al[12]conducted on Saudi population to determine correlation between the dental with skeletal relationship in the sagittal plane using orthodontic casts and cephalometric radiographs of 124 patient which showed weak association between molar relation and ANB (p =0.2075) nor with the WITS (p=0.4794) appraisal. Although incisor relation was not evaluated in the current study, but these support the present result as far as molar relation is concerned. Similarly our result is also coinciding done in our region by an investigator[13] correlating the Skeletal with Dental malocclusion in the Sagittal Plane which showed weak correlation between dental (angle classes of molars) and skeletal (ANB, WITS Appraisal) interrelationship.

The results of the present investigation are in disagreement with the findings of Shrikant et al[14] who had reported a significant positive association existed between molar and ANB classification. Their result is different from our study because they conducted study on a large sample 276 and having no exclusion criteria except any gross obvious pathology in jaw or TMJ ankylosis.

Overall, our results shows positive association between ANB AND Witt's Appraisal (.355), both are used for measuring skeletal discrepancy in the sagittal plane and in addition to it, other diagnostics criteria including molar relationship is recommended for better treatment results.

CONCLUSION

On the basis of cephalometric and study model analysisit was concluded that there was a weak correlation between Dental and Skeletal malocclusion.

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1 Shahab Adil:	Principal Researcher, Configured and analyzed results, Proof reading.
2 IqraBassar:	Data collection and Article writting.
3 Adnan Tariq:	Compiled data and Configured results.