

Malocclusion in Relation to Centric Relation and Maximum Intercuspatation Coincidence and Gender

Malocclusion
with Centric
Relation and
Maximum
Intercuspatation

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ABSTRACT

Objective: The purpose of this study is to find out the association of different classes of Angles malocclusion with centric relation (CR) and maximum intercuspation position (MIP) coincidence and gender.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Sir Syed College of Medical Sciences (dental section) for Girl and Dow Dental College, Karachi in September 2022 till December 2022.

Materials and Methods: Fifty five participants were selected as per selection criteria through purposive sampling technique. Different classes of Angles malocclusion were observed in relation to centric relation (CR) and maximum intercuspation position (MIP) coincidence and gender. Data was investigated by SPSS software 16. Chi square was used to figure out the association of different classes of Angles malocclusion with centric relation and maximum intercuspation coincidence and gender.

Results: Dental class I was more prevalent along with the presence of centric relation and maximum intercuspation coincidence. However there was no statistically significant association of different classes of Angles malocclusion with centric relation and maximum intercuspation coincidence and gender ($p>0.05$)

Conclusion: Different classes of malocclusion are devoid of association with centric relation and centric occlusion coincidence and gender.

Key Words: Angles malocclusion, centric relation, centric occlusion and gender

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INTRODUCTION

The relationship of maxillary and mandibular teeth is an essential concern whenever complete mouth rehabilitation of partially or fully dentate patients is being considered, as these effect the static and dynamic occlusion.^{1,2} Occlusion is the static relationship between maxillary and mandibular teeth.³ When the maxillary and mandibular teeth are in maximum intercuspation (MI) then this position is called maximum intercuspation position (MIP) and this is independent of condylar position.⁴

Centric relation (CR) on the other hand is independent of teeth contact. The academy of Prosthodontists defines CR as “the maxillo-mandibular relationship in which the condyles articulate with the thinnest avascular portion of their respective disks with the condyle in the anterior–superior position against the slopes of the articular eminence”. This position is independent of teeth contact.⁵

In an ideal occlusion CR and MIP should coincide with each other, however there are numerous cases where malocclusion exists.⁶ A classification of malocclusion was proposed by Angle which still holds a great significance today.⁷ According to him ideal occlusion was based on the position of the permanent first molars. If the permanent molars were in a correct relation then the remaining teeth would follow a smooth curve of occlusion. In Angle’s classification only maximal intercuspation is considered.^{8,9}

Prosthodontic therapy regularly deals with discrepancies between CR and MIP when restoring the partially and completely dentate patient.⁹ The literature broadly concludes that CR and MIP are not coincident for the majority of partially and completely dentate patients.^{8,9} There is a need to assess whether this discrepancy exists in patient with different classes of angles malocclusion.

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Therefore the purpose of this study was to evaluate if there is co-incidence of centric relation and maximum intercuspation position in relation to Angles malocclusion and gender.

MATERIALS AND METHODS

This study was carried out in Sir Syed College of Medical Sciences (dental section) and Dow Dental College during the period of September 2022 to December 2022. Purposive sampling technique was utilized in which fifty five participants were chosen from both the genders which were either dentists, house officers or final year students. Reason of using purposive sampling technique and involving participants from dental community was to make sure that participants understands the instructions and provides a correct response. In order to ensure inter operator reliability and validity, participants were examined by two operators.

In order to observe Angles malocclusion, participants' were asked to sit on a dental chair in an upright position. Participants were then asked to close their teeth in maximum intercuspation and their cheeks were retracted with mouth mirror. Visual observation was done for both the sides under chair light and observation was noted on response form.¹⁰

To observe whether centric relation and maximum intercuspation coincides or not, participants were asked to open their mouth wide open and then touch their tip of tongue to posterior most part of palate. After this participants were asked to elevate their mandible and stop when opposing tooth/teeth make their first contact. If all the teeth intercusate maximally at first tooth contact, centric relation was regarded as coincident with maximum intercuspation and vice versa. In order to reconfirm the response, bimanual manipulation method was also used.¹¹

Data analysis was done by using SPSS 16.0. Chi-square was used to find out the association of different classes of Angles malocclusion with CR and MIP coincidence and gender.

Inclusion Criteria:

- 1. Participants with 28 permanent teeth
- 2. Final year BDS students, house officers and dentists
- 3. No temporomandibular disorder
- 4. No wear pattern

Exclusion Criteria:

- 1. Participants undergoing orthodontic treatment
- 2. Participants with fixed and removable prosthesis
- 3. Different class of malocclusion on each side
- 4. History of craniofacial trauma

RESULTS

In total fifty five participants were selected according to inclusion and exclusion criteria. Out of fifty five participants 13 were males and 42 were females (Table 1).

Out of 13 males, 8 had class 1 malocclusion, 4 had class 2 division 1 and 1 had class 2 div 2 malocclusion. Out of 42 females, 32 had class 1 malocclusion, 8 had class 2 division 1 and 2 had class 2 division 2 malocclusion. There was no statistically significant association of different classes of Angles malocclusion and gender ($p>0.05$) (Table 2) (Fig.1).

25 participants of Class 1, 6 of Class 2 div.1 and 2 of Class 2 div.2 had coincidence of CR and MIP. 15 participants of Class 1, 6 of Class 2 div.1 and 1 of Class 2 div.2 did not have coincidence of CR and MIP. There was no statistically significant association of different classes of Angles malocclusion with presence or absence of CR and MIP coincidence ($p>0.05$) (Table 3) (Fig. 2).

Table No.1: Distribution of gender

Gender	Frequency	Percentage
Male	13	23.6%
Female	42	76.3%
Total	55	100%

Table No.2: Distribution of gender in different classes of malocclusion

Gender	Class 1	Class 2 div. 1	Class 2 div. 2	Total
Male	8	4	1	13
Female	32	8	2	42

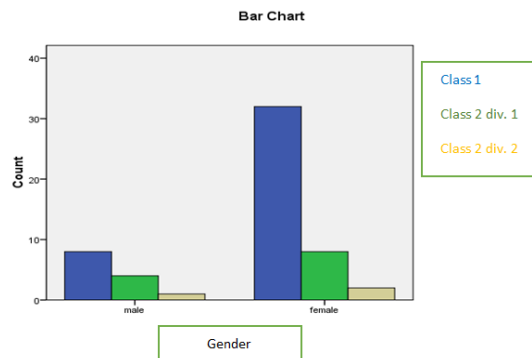


Figure No.1: Bar Chart – Gender

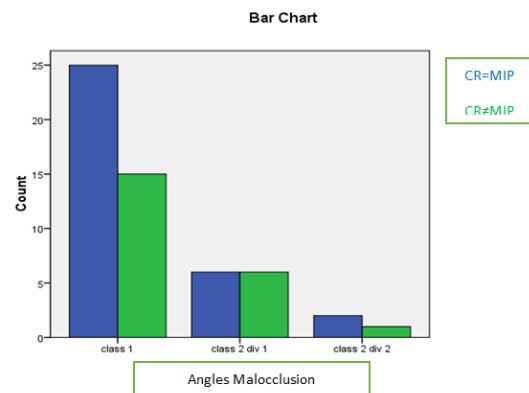


Figure No.2: Bar Chart – Angles Malocclusion

Table No.3: Co-incidence of CR and MIP in different classes of malocclusion

C0-incidence of CR and MIP	Class 1	Class 2 div.1	Class 2 div.2	Total
Present	25	6	2	33
Absent	15	6	1	22

DISCUSSION

Occlusion plays a pivotal role in dentistry and since it is not related to a single specialty, its importance cannot be neglected with any sort of dental treatment. Occlusion basically means contact of teeth and this contact is not related to teeth only but also comprises of periodontium and articulatory system which altogether makes a masticatory system. Satisfactory occlusion is essential if masticatory system needs to be devoid of pathological condition.

Malocclusion is basically a difference in relationship of upper and lower teeth characterized by variances of tooth position.¹² Different methods have been opted to classify malocclusion but in this study Angles method was chosen because it is more commonly used. It does not only describes malocclusion but also divides it further which is more practical and easy to use.¹³

To record centric relation position in any candidate it requires high expertise and does not matter whether the candidate is dentate, partially dentate or completely edentulous. Recording centric relation in complete and partially dentate candidates becomes even more difficult because they are more prone to close their teeth in their habitual position. Two broadly divided methods in literature to record centric relation position are operator guided and patient guided. In this study both the methods were applied but final confirmation was made on operator guided method (bimanual manipulation) because of its recommendation in published literature.¹⁴

In this study majority of the participants had class 1 malocclusion followed by class 2 division 1 and class 2 division 2 which is in accordance to the statement mentioned in the study of Campbell and Goldstein⁸. While performing this study participants having class 3 malocclusion could not be found which can be taken as a limitation of this study. As the number of females were more so Class 1 malocclusion was also more followed by other classes. However there was no association of different classes of Angles malocclusion with gender which is in accordance to the study of Aslam et al¹⁰.

Difference in CR and MIP position is reported from 56-100% in some studies¹⁵⁻¹⁸. This study showed discrepancy in CR and MIP in less than 50% of participants. Study by Ferreira et al showed that there is no discrepancy between CR and MIP position¹⁹ in different classes of occlusion which is in accordance to this study.

CONCLUSION

Angles malocclusion is independent of centric relation and maximum intercuspation coincidence and gender.

Author's Contribution:

Concept & Design of Study: Zareen Afshan
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Final Approval of version: Zareen Afshan

Conflict of Interest: The study has no conflict of interest to declare by any author.

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