

ORIGINAL ARTICLE**Cephalometric variables among patients with TMJ disorders: A Research**Nameeta Kaur¹, Ankur Aggarwal²¹Associate professor, ²Senior Lecturer, Department of Orthodontics, DJ College of Dental Sciences, Modinagar, U.P., India**ABSTRACT**

Background: Temporomandibular joint disorders (TMJDs) are common in adults; as many as one third of adults report having one or more symptoms, which include jaw or neck pain, headache, and clicking or grating within the joint. Hence, we planned the present study to assess the cephalometric characteristics in TMD patients. **Materials & methods:** A total of 40 subjects were included in the present study and were broadly divided into two study groups as follows: Group 1: Subjects with symptomatic TMD, Group 2: Healthy controls. Following parameters were analysed: SNA°, SNB°, ANB°, SN-MP°, AR-Go (MM), UI-SN° and LI-MP°. SPSS software was used for analysis of all the results. **Results:** While comparing most of the lateral cephalometric parameters among the subjects with TMJDs and healthy controls, significant results were obtained. **Conclusion:** A reduction in the forward growth of maxilla occurs in TMJD patients.

Key words: Cephalometric, Temporomandibular Joint.

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INTRODUCTION

Temporomandibular joint disorders (TMJDs) are common in adults; as many as one third of adults report having one or more symptoms, which include jaw or neck pain, headache, and clicking or grating within the joint.^{1,2} Most symptoms improve without treatment, but various noninvasive therapies may reduce pain for patients who have not experienced relief from self-care therapies.³⁻⁵ Although the onset is not well characterized, correlations between internal derangement and osteoarthritic change have been identified. Because of the complex and unique nature of each TMD case, diagnosis requires patient-specific analysis accompanied by various diagnostic modalities. Likewise, treatment requires customized plans to address the specific characteristics of each patient's disease.⁶⁻⁸ Hence, we planned the present study to assess the cephalometric characteristics in TMD patients.

MATERIALS & METHODS

We planned the present research in the department of orthodontics and it included assessment of cephalometric variables in patients with TMD. A total of 40 subjects were included in the present study and were broadly divided into two study groups as follows:

Group 1: Subjects with symptomatic TMD

Group 2: Healthy controls

Inclusion criteria for group 1 subjects included:

- Patients pain, tenderness, or clicking/ crepitus in the pre-tragal region
- Patients with absence of any other form of fibro-osseous disorder
- Patients with negative history of ankylosis

A pre-formed performa was made and complete clinical and medical history of all the subjects was obtained. In all the subjects, lateral cephalometric radiography was performed. Analysis of all the images was done. Following parameters were analysed: SNA°, SNB°, ANB°, SN-MP°, AR-Go (MM), UI-SN° and LI-MP°; based on criteria described previously in the literature.⁹ SPSS software was used for analysis of all the results and Mann-Whitney U test was used for evaluation of level of significance.

RESULTS

Among the patients with TMJ disorders, the most common etiologic factors included unknown aetiology, TMJD due to dental procedures, due to Orthodontic treatment, due to Missing teeth, and due to occlusal discrepancy group. Among the subjects of the Group 1 and group 2, mean age of the subjects was 18.6 years and 19.5 years respectively. 12 males and 8 female subjects were there in the group 1, while 11 males and 9 females were there in the group 2. While comparing most of the lateral cephalometric parameters among the subjects with TMJDs and healthy controls, significant results were obtained.

Table 1: Distribution of subjects according to aetiology

Etiologic factor	Number of patients	Percentage
Unknown	7	35
Due to dental procedures	5	25
Due to Orthodontic treatment	4	20
Due to Missing teeth	2	10
Due to Occlusal discrepancy group	2	10

Graph 1: Distribution of subjects according to aetiology

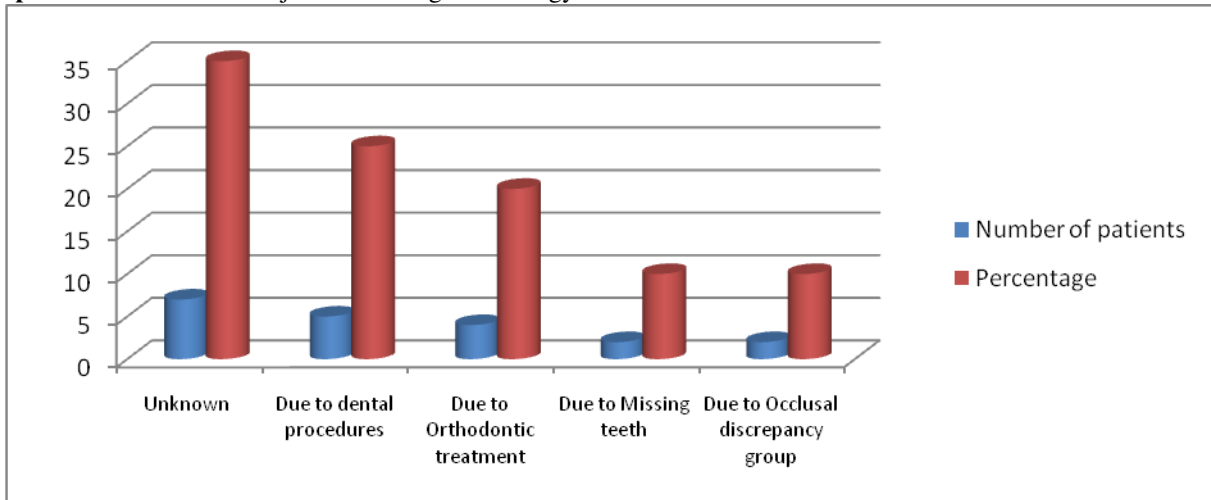


Table 2: Mean age and gender-wise distribution

Parameter	Group 1	Group 2
Number of subjects	20	20
Mean age (years)	18.6	19.5
Males	12	11
Females	8	9

Table 2: Comparison of parameters between the study group and the control group

Mean lateral cephalometric parameter	Group 1	Group 2	p- value
SNA°	83.2	85.6	0.00*
SNB°	81.9	81.7	0.88
ANB°	5.6	5.9	0.08
UI-SN°	112.4	118.5	0.01*
SN-MP°	34.9	36.3	0.09
LI-MP°	97.6	101.1	0.01*
AR-Go (MM)	46.3	46.9	0.22

*: Significant

DISCUSSION

In the present study, analysis of a total of 20 TMJD patients and 20 healthy controls was done. Among the patients with TMJ disorders, the most common etiologic factors included unknown aetiology, TMJD due to dental procedures, due to Orthodontic treatment, due to Missing teeth, and due to occlusal discrepancy group. Hwang CJ et al determined the relationship between craniofacial skeletal structures and TMJ disorders by using lateral cephalogram measurements to examine the characteristics of the facial profile of patients with TMJ disorders. Of 111 patients over 18 years of age from the Department of Orthodontics were chosen as the experimental group (56 patients), and patients without TMJ disorders were chosen as the control group (55 patients). A lateral cephalogram of each subject was taken and traced to

confirm the significance of the craniofacial measurements between the experimental group and the control group of Class I (mean ANB angle, 2.89 degrees), Class II (mean ANB angle, 6.32 degrees), Class III (mean ANB angle, - 2.02 degrees) patients, who were grouped according to ANB-angle difference. Each experimental subject with a TMJ disorder had a hyperdivergent facial profile, more lingual tilting of the maxillary incisors, and a steeper inclined occlusal plane. There was a significant correlation between the structure of the lower face and the temporomandibular disorder.¹⁰ Among the subjects of the Group 1 and group 2, mean age of the subjects was 18.6 years and 19.5 years respectively. 12 males and 8 female subjects were there in the group 1, while 11 males and 9 females were there in the group 2. While comparing most of the lateral

cephalometric parameters among the subjects with TMJDs and healthy controls, significant results were obtained. Almășan OC et al established the changes in posteroanterior cephalometric variables in subjects with temporomandibular joint disorders (TMDs). Posteroanterior cephalograms of 61 subjects (age range 16-36.6 years, standard deviation 4.88 years) were used to determine cephalometric differences. Subjects were classified according to the Research Diagnostic Criteria for Temporomandibular Joint Disorders into three groups: unilateral TMD, bilateral TMD and no TMD. 14 linear and angular measurements were assessed on the posteroanterior cephalogram. For assessing facial asymmetry, the asymmetry index for bilateral measurements was calculated between the right and the left side. In cases with unilateral TMD, the asymmetry index was calculated using the difference between the unaffected and affected side. 47 subjects were females (77%) and 14 were males (23%). 19 subjects had unilateral TMDs and 16 subjects had bilateral TMDs. The asymmetry index of the distance from the horizontal plane to the antegonion was higher in subjects with unilateral TMD than in patients with bilateral or no TMD ($p < 0.05$). Also, the asymmetry index of the distances from the vertical plane to the condyle ($p = 0.05$), gonion (Go) ($p = 0.0004$), antegonion ($p = 0.002$) and chin (Ch) ($p = 0.02$) was higher in subjects with unilateral TMDs. The asymmetry index of the O point-Go-Go' and O point-Ch-Ch' angles differed significantly in subjects with unilateral TMDs ($p < 0.05$). Unilateral TMDs are associated with changes in posteroanterior cephalometric measurements.¹¹ Ahn SJ et al analyzed the relationship between facial asymmetry and TMJ internal derangement (ID) by using posteroanterior cephalometric variables, and to compare the findings with the results of magnetic resonance imaging (MRI). The sample consisted of women seeking orthodontic treatment at Seoul National University Dental Hospital who had routine posteroanteriorcephalograms and bilateral MRIs of the TMJ. To eliminate the influence of condylar hyperplasia on facial asymmetry, only those with SNB angles less than 78 degrees were selected ($n = 63$). They were classified into 5 groups according to the results of the MRI: bilateral normal disk position, unilateral normal TMJ and contralateral disk displacement with reduction (DDR), bilateral DDR, unilateral DDR and contralateral disk displacement without reduction (DDNR), and bilateral DDNR. Fourteen variables from posteroanterior cephalograms were analyzed with 1-way ANOVA to evaluate differences among the 5 groups. Subjects with TMJ ID of greater severity on the unilateral side had shorter ramal height compared with those with bilateral normal or bilateral DDR or bilateral DDNR. In addition, the mandibular midpoint deviated toward the side where the TMJ ID was more advanced. Subjects with a more

degenerated TMJ on the unilateral side might have facial asymmetry that does not come from condylar or hemi-mandibular hyperplasia.¹²

CONCLUSION

From the above results, it can be concluded that a reduction in the forward growth of maxilla occurs in TMJD patients. Hence; further studies are required for better exploration of results.

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