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ORIGINAL ARTICLE

Evaluation of frankfort mandibular plane angle in known population- A lateral cephalometric study

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ABSTRACT:

Background: Cephalometrics can be utilized to describe, compare and classify the nature of orthodontic problems. The present study was conducted to evaluate frankfort mandibular plane angle in known population. **Materials & Methods:** 180 subjects age ranged 18-40 years of both genders were subjected to lateral cephalogram. Angular measurements comprised of Frankfort mandibular plane angle (FH-MP) angle, Incisor mandibular plane angle (IMPA) and Frankfort mandibular incisor angle (FMIA). **Results:** Out of 180 subjects, males were 95 and females were 85. The mean FMPA was 26.4 inn males and 26.1 in females, IMPA was 97.3 in males and 94.5 in females and FMIA was 56.9 in males and 59.0 in females. The difference was significant (P< 0.05). **Conclusion:** The study found that frankfort mandibular plane angle was higher in males than females.

Key words: Cephalometrics, Frankfort mandibular plane angle, Incisor mandibular plane angle

The limitation of the study is small sample size.

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INTRODUCTION

Frankfurt horizontal plane was first established at a World Congress on anthropology in Frankfurt, Germany in 1884. They decided that the eye/ear plane is most nearly parallel to the earth's surface. The Frankfurt plane is a line that passes from the bottom of the eye socket through the top of the ear opening.[1] This is the plane in which the head is normally carried during life. The Frankfurt- mandibular plane angle is an angle formed by the intersection of the Frankfort horizontal plane and the mandibular plane. The significance of the Frankfurt- mandibular plane angle (FMA) to prosthodontic diagnosis, treatment planning and prognosis in class II malocclusions has been well documented.[2]

Cephalometrics can be utilized to describe, compare and classify the nature of orthodontic problems. Different analyses and their corresponding norms have been formulated by various authors to interpret the diagnostic data that the lateral cephalogram provides. Among the investigators, the systematic approaches developed by Downs, Steiner, Ricketts and Tweed probably gained the widest acceptance. However, their norms were usually based on Caucasian samples only.[3] Among the investigators, the systematic approaches developed by Downs, Steiner, Ricketts and Tweed probably gained the widest acceptance. However, their norms were usually based on Caucasian samples only. The cephalometric norms of different ethnic and racial groups established in various studies show that normal measurements for 1 group are not necessarily normal for another group; each racial group must be treated according to its own characteristics.[4] The present study was conducted to evaluate frankfort mandibular plane angle in known population.

MATERIALS & METHODS

The present study comprised of 180 subjects age ranged 18-40 years of both genders in department of orthodontics and dentofacial orthopedics. Enrolment in the study was performed after obtaining their written consent. The consent for the study was obtained from ethical committee.

Demographic profile of all subjects was recorded. All were subjected to lateral cephalograms taken with Kodak machine operating at 80 kVp, 15 mA and 2.5 seconds exposure. Various references points, planes and angles were drawn and recorded. Angular measurements comprised of Frankfort mandibular plane angle (FH-MP): angle formed by extending mandibular plane to Frankfort horizontal plane, Incisor mandibular plane angle (IMPA): Angle formed by extending lower incisor long axis to the mandibular plane and Frankfort mandibular incisor angle (FMIA): Angle formed by extending mandibular incisor long axis to the Frankfort horizontal plane were recorded. Linear measurements comprised of Frankfort horizontal plane: A plane connecting a point 4.5 mm above the geometric centre of the ear rod and an orbitale point midway between the left and right lower border of the orbit, Mandibular plane: A plane tangent to the lower border of mandible which connects with the menton

anteriorly and posteriorly it bisects the distance between the right and left lower borders of the mandible in the region of the gonial angle and Mandibular incisor long axis: A plane made by extending the long axis of the mandibular central incisor downward to the mandibular plane and upward to the Frankfort plane were recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of subjects

Total- 180		
Gender	**Males**	**Females**
Number	95	85

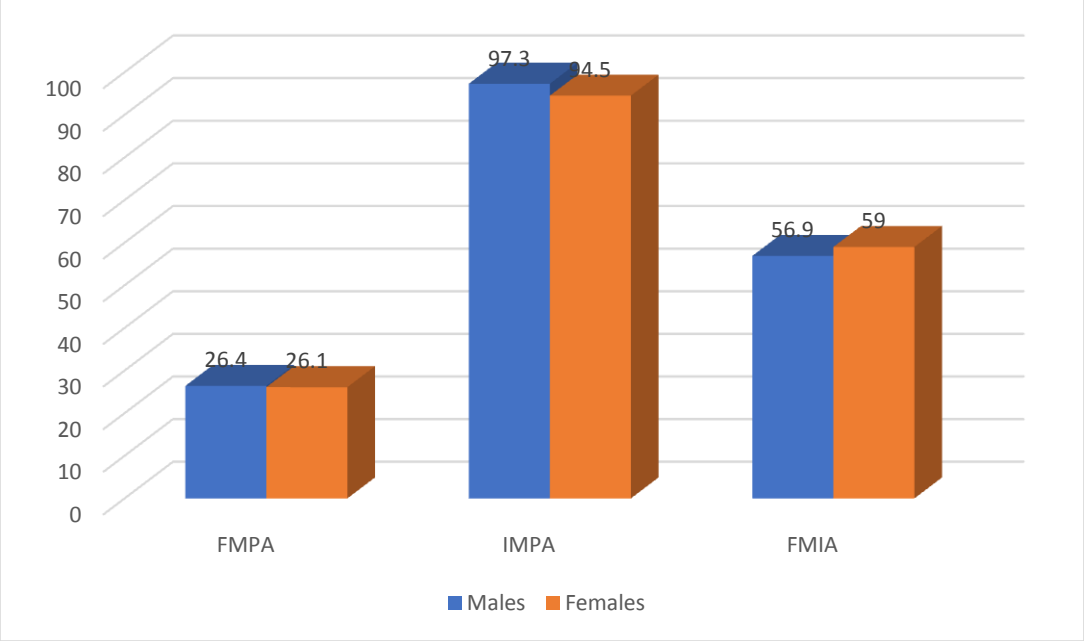
Table I shows that out of 180 subjects, males were 95 and females were 85.

Table II Comparison of parameters

Parameters	Males	Females	P value
FMPA	26.4	26.1	0.05
IMPA	97.3	94.5	0.12
FMIA	56.9	59.0	0.16

Table II, graph I shows that mean FMPA was 26.4 inn males and 26.1 in females, IMPA was 97.3 in males and 94.5 in females and FMIA was 56.9 in males and 59.0 in females. The difference was significant (P< 0.05).

Graph I Comparison of parameters



DISCUSSION

Angle (1899) classified the malocclusions based on occlusal relationships, considering the first permanent molar as the "key" of occlusion. Assuming that the maxillary first permanent molar was stable in the anteroposterior relationship with respect to the cranium, Angle based his classification on the mandibular position as defined by the lower first permanent molar with respect to the upper first permanent molar.[5] In a Class II molar relationship, the lower first permanent molar is more posterior to the upper molar first permanent molar. Angle believed that this was a result of either a short, underdeveloped lower jaw or a posteriorly positioned mandible. A number of standards have been developed for various racial and ethnic groups. It is important to compare a patient's cephalometric findings with the norms for his or her ethnic group for an accurate diagnostic evaluation, with the consideration of his or her treatment goals and needs. Since well-established Indian ethnic norms are lacking, norms derived for Caucasian population are routinely used for investigations. As these norms show a great degree of variation when applied to different populations, it becomes necessary to establish the norms for every ethnic group.[6] The present study was conducted to evaluate frankfort mandibular plane angle in known population.

In present study, out of 180 subjects, males were 95 and females were 85. A et al[7] conducted a study on

100 lateral cephalographs which were selected from the records in the Department of Orthodontics and Dentofacial Orthopedics. According to results there was a higher FMPA in males than females in Western Rajasthan population. While observing the overall result no significant difference was observed in FMPA between male and female population of Western Rajasthan. The result of the study indicated that separate norms should be considered for West Rajasthan males and females during diagnosis and treatment planning.

We found that mean FMPA was 26.4 inn males and 26.1 in females, IMPA was 97.3 in males and 94.5 in females and FMIA was 56.9 in males and 59.0 in females. The improvement of facial esthetics has rapidly become one of the desirable objectives of orthodontic treatment and the concept of normal has become indispensable to an orthodontist.[8] The term normal was defined by Tweed as "The balance and harmony of proportions considered by the majority of us as most pleasing in the human face." However, since soft tissue, dental and skeletal structures exhibit different pattern for different races, it has become relevant to define norms for various ethnic groups of population for successful diagnosis and treatment planning. India is a land of diversified race of people. Hence, many research workers in India have initiated to undertake racial studies.[9,10]

Alam M et al[11] conducted a study to evaluate and compare the FMPA in Bangladeshi young males and females. It was concluded that Bangladeshi females were found to have significantly smaller FMA (26.14) than Bangladeshi males (27.24). Hashim et al[12] conducted a study to evaluate and compare the FMPA in Bangladeshi young adults. It was concluded that Bangladeshi females were found to have significantly smaller FMA (24.6) than Bangladeshi males (26.2).

CONCLUSION

Authors found that frankfort mandibular plane angle was higher in males than females.

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