

- Subjects with angle’s class I occlusion
- Normal overjet and overbite
- No crossbite
- Competent lips
- Subjects with history of systemic disease were excluded from the study
- Consent from the parents of each subject was taken after explaining the nature and purpose of radiograph

Manual tracing was done for all the lateral cephalograms and Steiner’s and Down’s analysis was carried out.

Statistical analysis

The measurements were statistically analyzed by calculating their means and Standard Deviations (SD).

Then the means of Maratha ethnic population were compared with means of caucasian population with the help of student’s unpaired t-test.

RESULTS

Different races in the World have different ethnic origins. Hard and soft tissue cephalometric parameters are different for different ethnic groups. Hence, there cannot be any single standard cephalometric norms of one population which could be applied to other groups [4]. Hence, an attempt is made to establish norms for population of Vidarbha (Figures 1,2 and Tables 1,2).

Table 1: Down’s analysis.

Sr. no.	Parameter	Standard value		Present study n	Difference			
		Range	Mean value		Range	Mean value	SD	
1	Facial angle (in degrees)	82.0-92.0	87.8	300	79-94	84.46	3.28	3.34
2	Angle of convexity (in degrees)	-8.5 to +10	0	300	-34	4.87	6.35	4.87
3	AB plane angle (in degrees)	-9 to +0	-4.6	300	-24	1.92	6.27	6.52
4	Mandibular plane angle (in degrees)	17 to 20	21.9	300	15-40	26.48	6.03	4.58
5	Y-axis (in degrees)	53 to 66	59.4	300	53-73	63.76	4.67	4.36
6	Cant to occl. plane	1.5 to 14	9.3	300	0-17	10	4.15	0.7
7	Inter incisal angle (in degrees)	130 to 150	135.4	300	81-136	109.95	10.85	25.45
8	Incisor occlusal plane angle (in degrees)	3.5 to 20	14.5	300	14-35	19.8	5.95	17.83
9	Incisor to mandibular plane angle	-8.5 to 7	1.4	300	43952	10.2	5.71	12.8
10	U1 to A-Pog linear (in mm)	-1 mm to 5 mm	2.7	300	42430	10.12	2.81	7.42

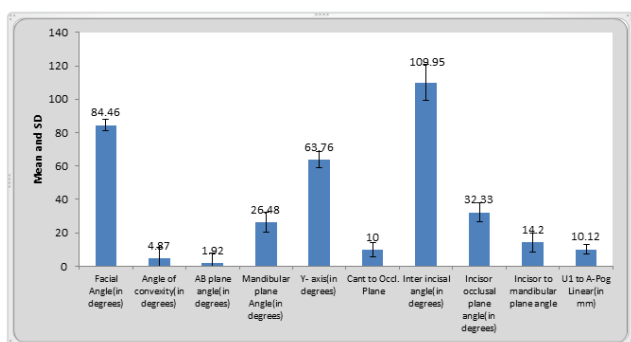


Figure 1: Down’s analysis.

Table 2: Steiner analysis.

Sr. no.	Parameter	Caucasian standard values (mean ± SD)	Present study				Difference
			n	Range	Mean value	SD	
1	SNA (in degrees)	82.0 ± 2.0	300	73-90	83.82	3.58	1.82
2	SNB (in degrees)	80.0 ± 2.0	300	74-88	81.1	3.74	1.1
3	SND (in degrees)	76.0 ± 2.0	300	70-85	78.19	3.61	2.19
4	ANB (in degrees)	2.0 ± 2.0	300	-10	2.9	2.44	0.9
5	Go-Gn to SN (in degrees)	32	300	14185	36.94	4.5	4.06
6	U1 to N-A (in mm)	4	300	43191	8.53	3.01	4.53
7	U1 to N-A (in degrees)	22	300	18415	30.61	9.26	8.61
8	L1 to N-B (in mm)	4	300	42036	7.62	2.68	3.62
9	L1 to N-B (in degrees)	25	300	17-45	34.96	5.84	9.96
10	L1 to U1 (in degrees)	131	300	81-136	110.58	13.01	20.42
11	Occl to S-N (in degrees)	14	300	43497	11.51	3.66	2.49

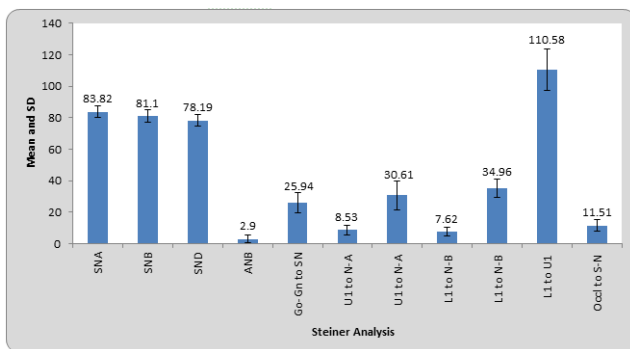


Figure 2: Steiner analysis.

The ranges of most of the dimensions of the present study were significantly different than those obtained by Steiner, although all selected individuals had a pleasant appearance and good facial harmony [5].

Facial angle

Facial angle is ideally used in down's to measure the degree of retrusion and protrusion of the lower jaw. The magnitude of this angle increases with prominent chin. In the current study the mean facial angle in the current is 84.46° which differed from caucasian population of 87°.

Angle of convexity

A positive angle suggests prominence of the maxillary denture base relative to the mandible where as a negative suggest a prognathic profile [6]. The caucasians have norm of 0 degree where as in the current study the south Indian population have +4.87°.

AB plane angle

This angle is suggestive of maxilla-mandibular relationship to the facial plane. Standard values lie in the

range of -9° to 0° with mean value of -4.6°. The current study depicts Vidarbhan population showed more positive values [7]. Range of the current study ranged from -12°-0° with mean range of +1.92°.

Mandibular plane angle

This angle is suggestive of relation between mandibular plane (Go-Me) to the FH plane. The angle provides essential information regarding growth pattern of the individual. The mean value for caucasian population is 21.9° differing from our values by 4.58°, 26.4°.

Y Axis

The angle is suggestive of growth pattern in relation to the cranial base with the Frankfort horizontal plane with an average value of 59°. An increased value is suggestive of class II facial pattern and also suggests vertical growth pattern, while decreased value of this angle is seen in class III individuals indicative of horizontal growth pattern. The values of our study showed slight increase in the values by 4.3°.

Cant of occlusal plane

This angle gives a measure of slope of occlusal plane relative to the FH plane. The value increases in downward or clockwise tipped occlusal planes mostly in vertical growers, whereas the decreased value is suggestive of anticlockwise tip of the occlusal plane often appreciated in the horizontal growers [8]. Current study values for Vidarbha population shows almost equal values when compared to caucasian norms with a mild variation of 0.7.

Inter incisal angle

The by the long axis of incisors. The angle suggests proclination of incisors. Standard angle is formed caucasian values being 131° differing from the current findings of Vidarbhan population which came to be 109.9° .

Incisor to occlusal plane angle

This is the inside inferior angle formed by the intersection between the long axis of lower central incisor and the occlusal plane and is read as a plus or minus deviation from a right angle. Average value according to caucasian norms is 14.5° (3.5° to 20°). An increase in this angle is suggestive of increased lower incisor proclination. Our study findings showed an increased value of 19.8° [9].

Incisor mandibular plane angle

This angle is formed by intersection of the long axis of the lower incisor and the mandibular plane. Average value being 1.4° (-8.2° to 7°). An increase in this angle is suggestive of increased lower incisor proclination. Values from current findings showed 10.2° of proclination of lower incisors.

Upper incisor to A-Pog

This is a linear measurement between the incisal edge of the maxillary central incisor and the line joining point A to pogonion. This distance is on an average 2.7° (range- 1° to 5°) of the caucasian population. The measurement is increased in patients presenting with upper incisor proclination. Current study showed an average of 10.12° of mean proclination [10-12].

Steiners analysis

SNA: The angle is formed by SN plane and point A. This angle is suggestive of relation of maxilla to cranial base. Increased angle is indicative of prognathic maxilla while reduction in the value of this angle is suggestive of retro positioned maxilla. Caucasian value is $82.2 \pm 2^\circ$ present study value deviated by 1.82° , mean being 83.82° which means Vidarbhan population depicts slight prognathism.

SNB: The angle is formed by SN plane and point B. This angle is suggestive of relation of mandible to cranial base [13]. Increased angle is indicative of prognathic mandible while reduction in the value of this angle is suggestive of retro positioned mandible. Caucasian value is $80.0 \pm 2^\circ$ present study value deviated by 1.1° , mean being 81.1° which means Vidarbhan population depicts slight prognathism.

SND: The angle is formed by SN plane and point D. This angle is suggestive of relation of chin to cranial base. Increased angle is indicative of prognathic chin while reduction in the value of this angle is suggestive of retro positioned chin. Caucasian value is $76.0 \pm 2^\circ$ present study value deviated by 2.19° , mean being 78.19° which means Vidarbhan population depicts slight prognathism.

ANB: The angle is formed by point A-N-B. The angle gives measure of the skeletal pattern of the individual. Increased or positive angle is suggestive of class II profile while negative angle, point B ahead of point A indicates class III skeletal profile. Caucasian population values are $+2.90^\circ$ suggestive of class II facial profile prevalence.

Mandibular plane (Go-Gn to Sn): This angle is suggestive of relation between mandibular plane (Go-Gn-Sn) to the Sn plane. The angle provides essential information regarding growth pattern of the individual. The mean value for caucasian population is 32° differing from our values by 4.6° , 36.4° . There was slight inclination of Vidarbhan population towards vertical growth pattern.

U1 to NA (degrees and mm): This parameter gives measure of inclination of upper incisors with respect to bony bases point N and A. Normal caucasian values are 22° of inclination and 4 mm of protrusion (linear measurement) differing from our population in study by 8.61° and 4.9 mm mean values being 30.61° and 8.53 mm showing proclination and protrusion in Vidarbhan population.

Lo1 to NB (degrees and mm): This parameter gives measure of inclination of lower incisors with respect to bony bases point N and B. Normal caucasian values are 22° of inclination and 4 mm of protrusion (linear measurement) differing from our population in study by 8.61° and 4.9 mm mean values being 30.61° and 8.53 mm showing proclination and protrusion in Vidarbhan population.

Interincisal angle (U1-L1): The angle is formed by the long axis of incisors. The angle suggests proclination of incisors. Standard caucasian values being 131° , differing from the current findings of Vidarbhan population which came to be 110.58° .

Occlusal plane to SN plane: This angle gives a measure of slope of occlusal plane relative to the SN plane. The value increases in downward or clockwise tipped occlusal planes mostly in vertical growers, whereas the decreased value is suggestive of anticlockwise tip of the occlusal plane often appreciated in the horizontal growers. Current study values for Vidarbha population shows almost equal values when compared to caucasian norms with a mild variation of 2.49° , mean value being 17.59° .

DISCUSSION

In the modern biological model, distinction is the theme and the clinician's task is to achieve the desired facial and dental outcomes within the ability of individual to adapt physiologically to the morphologic changes. India is one of the largest countries in Asia with four different zones-east, west, north and south. All four zones have different people having different facial characteristics. Over the centuries, Indian has received large groups of people of different ethnical and cultural origins. Thus, these will lead to dispersion of different ethnic groups in Indian population. Current requirements of present ability and

demand on good impressive appearance make it mandatory to study the pattern of ethnic groups.

An attempt was made to form the cephalometric norms for Vidarbhan population by studying the various facial forms and features. Most cephalometric analyses are designed for orthodontic diagnosis and treatment planning. As well established norms for specific ethnic groups are lacking, one had to rely on caucasian norms for the assessment of orthodontic patient. This seems to be logically inappropriate because any two different population groups have several dissimilarities in their dentofacial structures as is evident from the present study.

CONCLUSION

The present study was done on population of Vidarbha indicates that their facial pattern is not similar to caucasians. The positive findings includes retrusion of chin, the maxillary base was more prognathic when compared to the caucasians. The profile hence what normal was for Vidarbha population was convex profile. The growth pattern when compared to caucasian norms was more vertical. There was a clockwise tip in the occlusal plane. Both the maxillary and mandibular dentition showed an increased inclination when compared to caucasian norms, showed bimaxillary proclination.

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