



Establishing cephalometric norms for tribal population of Odisha

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ABSTRACT

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Urban civilization is more reliant on non-agricultural sectors such as industries and information technology, which are advancing at a faster pace than science and technology. Due to differences in ethnic origin and cultural beliefs, tribal populations' perceptions and treatment requirements alter.

AIM- The goal of this study was to develop Cephalometric Orthognathic Surgery guidelines for Odisha's tribal people and compare them to those established by Charles J Burstone and others.

Materials and methods- A Retrospective Study was conducted at Kalinga Institute of Dental sciences. Study sample consisted of 50 tribal individuals. Mean age group of individuals taken was 18-25 years. The subject was positioned as in natural head posture (NHP) first. The Cephalogram was then recorded in the normal manner, with the teeth in occlusion.

Results- When the cephalometric norms of Odisha's tribal people were compared to those of Caucasians, several indicators indicated a substantial difference. Eight of the 23 factors evaluated in the indigenous population indicated statistically significant differences. The parameters N-A-Pog, N-A, N-ANS, ANS-Gn, PNS-N, Upper incisor -NF (both linear and angular measures), and ANS -PNS deviate considerably from the norms of the Caucasian group.

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INTRODUCTION

Urban societies are based on their geographical surroundings and socio cultural characteristics. Tribal population on the contrary live in relative isolation marked with

distinct culture, language and beliefs. On the other hand, urban society is more dependent on non-agricultural sectors like industries, information technology sectors running along with fast growing science and technology.



Difference in ethnic origin and cultural beliefs leads to change in the perception and requirement of treatment in tribal population. According to the samples of Caucasian origin patients, the cephalometric evaluations developed by Steiner(1), Downs(2), Broadbent (3), Ricketts (5,6), and Sassouni(7) have similar parameters. According to Sassouni(7), Ricketts(5,6), and the rest of the authors, ethnic and racial groups have different sets of standards than Caucasian counterparts. In 1978 Burstone (8), using the cephalometric for orthognathic surgery (COGS) System, published cephalometric guidelines for instances requiring orthognathic surgery. Later with improved research and standards it is evident that cephalometric norms derived from one ethnic group may or may not be applicable to other ethnic groups.

Limited research on cephalometric evaluations of tribal population of Odisha made imperative to conduct a study for providing necessary cephalometric norms that are propitious in planning orthognathic surgeries of tribal and urban population of Odisha. Therefore, the purpose of this study was to create Cephalometric norms for Orthognathic surgery for the tribal population of Odisha and to compare them to the original norms established by Charles J Burstone and others. (8).

MATERIALS AND METHODS

A Retrospective Study was conducted at

Kalinga Institute of Dental sciences. Study sample consisted of 50 tribal individuals. Mean age group of individuals taken was 18-25 years. Inclusion criteria required the patient to be a native of odisha in tribal region upto two generations, who have never had orthodontic or orthognathic surgical therapy before. All with the exception of permanent third molars, all individuals had a nice facial appearance and a full complete dentition, having a molar relationship of Angles Class I was the main requisite to be included in the sample.

The subject was positioned as in natural head posture (NHP) first. From an artificial light source, a plumb line was placed on the right side of the subject, and its shadow was noticed on the right side of the subject's face. Over the shadow of the plumb line, two markings were drawn on the face, one at the outer canthus of the eye and the other around the angle of the jaw. This method was performed a couple more times to assure that the two markers constantly dropped on the plumb line's shadow. As a result, the correctness of NHP recording was confirmed. The Cephalogram was then recorded in the normal manner, with the teeth in occlusion. (9) . A single examiner traced the pattern on acetate paper with the help of a tracing board, and used a 0.5-mm lead pencil.

The COGS system was used to create all landmarks, reference points and measurements (FIGURE I).

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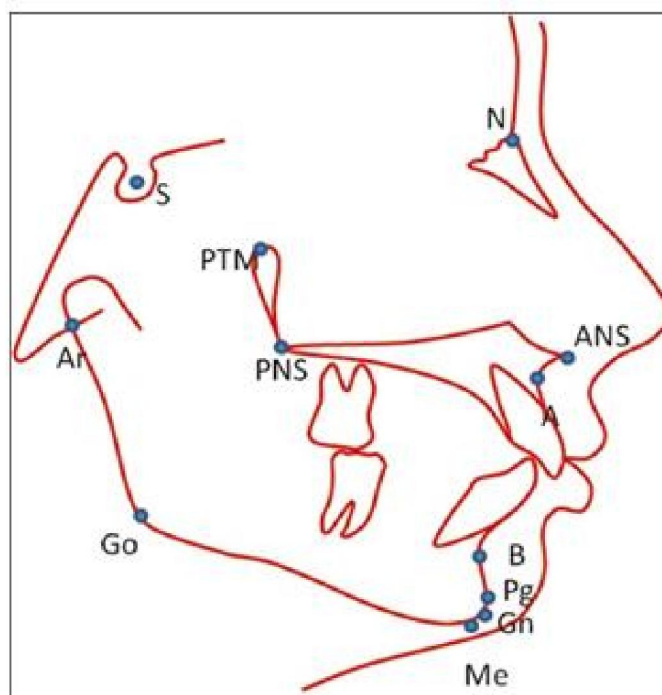


FIGURE 1: The above are the points and landmarks that were used in this investigation.

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TABLE 1: Comparison of the current study's parameters with previous cephalometrics for orthognathic surgery parameters.

MEASUREMNETS	COGS STUDY MEAN± SD	PRESENT STUDY MEAN± SD	Z VALUE
Ar-Ptm//to HP	37.1±2.8	35± 2.8	0.98
Ptm- N//to HP	52.8 +/- 4.0	53± 1.5	1.33
N-A-Pog	3.9° +/- 6.4°	20°±6.6°	4.3**
N-A	0.0 +/-3.7	8±4	5.6**
N-B	-5.3 +/-6.7	1.2±2.3	0.99
N-Pg	-4.3 +/-8.5	1.9±3.7	1.78
B-Pog	8.9+/- 1.7	6.7±0.9	1.22
N-ANS	54.7 +/- 3.3	41±5.8	6.66**
ANS-Gn	68.6 +/-3.8	72±8.6	2.98**
PNS-N	53.9+/-1.7	44±2.2	4.98**
MP-HP (ANGLE)	23.0°+/-5.9	22°±2°	1.1
Upper incisor-NF	30.5+/-2.1	39±4	5.98**
Lower incisor-MP	45.0+/-2.1	47±2.2	1.34
Upper molar -NF	26.2+/-2.0	28±3.4	1.1
Lower molar-MP	35.8+/-2.6	25±2.3	1.6
PNS-ANS	57.7+/-2.5	67±2.5	3.6**
Ar-Go	52+/-4.2	46±3.6	1.1



Go-Pog	83.7+/-4.6	80°±4.7	0.99
Ar-Go-Gn	119.1°+/-6.5°	128°±2.2	0.66
OP-HP	6.2°+/-5.1°	5.0°±3.3°	1.21
A-B II OP	-1.1+/-2.0	-0.89±1.0	1.2
Upper incisor –NF (ANGLE)	111.0°+/-4.7°	124°±3.3°	3.3**
Lower incisor- MP (ANGLE)	95.9°+/-5.2°	98	1.0

For each individual, 23 parameters were evaluated (TABLE 1). The measurements were recorded to the nearest 0.05 mm accuracy in both angular and linear directions. Version 15 of the Statistical Package for Social Sciences was used for data analysis (SPSS Inc., Chicago, Ill, USA). For each of the values, the mean and standard variations were computed. The Z-test was used to verify for equality of variance. It was statistically significant when $Z > 1.96$.

RESULTS

Data obtained on comparison of cephalometric norms of tribal population of Odisha with that of Caucasians showed significant difference in certain parameters. Among the compared 23 parameters, 8 parameters showed statistically significant difference in the tribal population. N-A-Pog, N-A, N-ANS, ANS-Gn, PNS-N, Upper incisor – NF (Both linear and angular measurements), ANS –PNS are parameters that are significantly differing from the norms of Caucasian sample. (TABLE 1)

DISCUSSION

Various analyses are being used to determine various cephalometric norms, including McNamara, Stieners, Gujaratis, North Indians, Maharashtrians (10), Bunts (I I), and Gurkhas are among the Indian population (12) These research have proven the differences in craniofacial traits between ethnic groups. Various other research on various ethnic groups from various geographic places, such as Japan, China, Iran, Korea, and African ancestry negro, have demonstrated the need of developing standards for regional populations for the purpose of deformity evaluation, interpretation, and treatment planning.

Burstone and Legan analysis is most

commonly used for planning The most frequent method for planning orthognathic surgery is Burstone and Legan analysis. Burstone analysis Cephalometric norms were derived from Caucasians, triggering the need for equivalent Cephalometric norms for the tribal peopleofIndia.

In present study, there is significant difference in skeletal and dental components that provide necessary information of maxilla. N-A-Pog parameter significantly determined a pronounced convex profile in tribal population of Odisha. Skeletally prognathic Maxilla was observed in tribal population of Odisha with a statistically significant N-A value. Even the parameters like upper incisor–NF both linear and angular values showed statistically significant difference from the Caucasian sample justifying Proclined and forwardly placed upper anterior teeth in tribal population. Vertical measurements like facial middle third (N-ANS) showed statistically significant reduction whereas lower facial third (ANS-Gn) was slightly increase. Statistically significant ANS-PNS value showed an increase in the maxillary length.

Among the 23 parameters of Burstone analysis, 15 parameters of tribal population are coinciding with that of Cephalometric values of Caucasian sample and 8 values are showing significant difference from that of Caucasian sample. Difference in environment and functional factors may be the reason behind these variations. Change in the Cephalometric norms of tribal population may be due to varid genetic pool of tribal population from that of others and Caucasians. Hence, it is imperative to customize the 8 parameters of Burstone analysis for proper diagnosis and treatment planning of tribal population of Odisha.

SUMMARY AND CONCLUSION



Difference in ethnicity and racial characteristics significantly influence the craniofacial structures. In this study, 23 cephalometric parameters (Burstone analysis) of tribal population were evaluated and compared from that caucasian population. 15 cephalometric parameters are showing similar characteristics where as 8 parameters are differing. Especially, cephalometric parameters related to position of maxilla are significantly differing from that of norms given using caucasian population. This observations made strong to tailor the cephalometric norms pertinent for orthognathic surgery in tribal population of Odisha.

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