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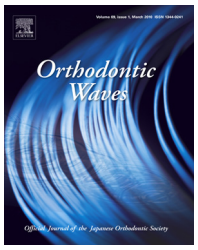

Original article

Craniofacial morphology of Upper Shimla Hill Population – A cephalometric study

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ABSTRACT

Aim: The aims of the present study were to study the hard and soft tissue cephalometric morphology and establish norms for the Upper Shimla Hill Population, Himachal Pradesh, India, to find similarity with any other racial group and to compare gender differences.
Materials and methods: Lateral cephalometric radiographs were obtained of Sixty Upper Shimla Hill subjects (30 male and 30 female; mean age 20.6 years and 19.6 years, respectively) with Angle's Class I molar relationship, well-aligned arches, and full complement of teeth except third molars. The lateral cephalograms were traced and 15 linear and 11 angular variables were obtained.
Results: A comparison with the Caucasians' norm showed that Upper Shimla Hill subjects had longer Anterior cranial base length and increased cranial base angle, retrognathic maxilla, horizontal growth pattern, and proclined upper incisors but reduced lip prominence. Female sample presented shorter anterior and posterior cranial base length, had shorter mandible, less total anterior and posterior face height and reduced lower anterior face height. Males had protrusive upper incisors and acute interincisal angle.
Conclusion: It was concluded that to evaluate any Upper Shimla Hill Population orthodontic patient, Upper Shimla Hill norms, and not Caucasians' norm must be used as a yardstick.

1. Introduction

Since the introduction of cephalometrics by Broadbent [1] in 1931, cephalometric standards have been derived for various population groups. The use of cephalometrics extends from the study of facial form or craniofacial morphology to the development of cephalometric norms [2]. However it is apparent that Caucasian norms are inappropriate for application to other racial groups, as racial characteristics lead to important cephalometric variations. There are a number of previous cephalometric studies of Indian population, including Nanda and Nanda [3] who studied North Indian Lucknow population, Kannappan and Balasubramanian [4] who investigated Madras city population, Bhat et al. [5] whose research looked at Bunt and Brahmin children of Dakshina Kannada and Kapila [6] studied Kikuyu children. It has been shown that differences within the same racial group can exist. Uesato et al. [7] noted that the craniofacial form of American-Japanese was different from native counterparts.

The different racial groups will have to be treated according to their own individual characteristics. Shimla lies in the

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Fig. 1 – Frontal and profile view of male and female subjects.

north-western ranges of the Himalayas. It has been observed that patients from a particular region of Himachal Pradesh, that is Upper Shimla Hill Population (Kotgarh and nearby areas) [8], have peculiar feature of class III skeletal pattern accompanied by class I occlusion.

The availability of local data on craniofacial morphology of this Upper Shimla Hill Population group will assist in their diagnosis, management and outcome assessment of orthodontic care. Thus the aim of this study is to establish a cephalometric description of the craniofacial morphology of Upper Shimla Hill Population.

2. Materials and methods

The study sample comprised of 60 subjects (30 females, average age 19.6 years and 30 males, average age 20.6 years) with age ranging from 17 to 25 years (average age 20.1 years). Subjects were included in the study if they belonged to Upper Shimla Hill Population (Kotgarh and nearby areas) of Himachal Pradesh, had both parents and grandparents belonging to the same population group, had full complement of teeth – third molars are not taken into consideration, had no previous history of

Table 1 – Double determination test for hard tissue variables.

S. no.	Parameters	(Mean) first measurement	(Mean) second measurement	t-Value	p-Value
Cranial base parameters					
1.	S-N (mm)	73	74	−1	NS
2.	S-Ba (mm)	50	49	0.095	NS
3.	N-S-Ba (°)	132	132	−0.709	NS
Jaws (sagittal) parameters					
4.	ANS-PNS (mm)	55.10	55.20	−0.429	NS
5.	Go-pogperp (mm)	85.60	85.30	1.0	NS
6.	Co-Gn (mm)	127.1	126.4	3.2	NS
7.	Go-pogperp: ANS-PNS	1.51	1.48	1.152	NS
8.	SNA (°)	80.95	80.45	2.121	NS
9.	SNB (°)	82.10	81.80	1.5	NS
10.	ANB (°)	−1.15	−1.35	0.70	NS
11.	A-N perp (mm)	−3.85	−4.30	1.711	NS
12.	Pog-N perp (mm)	−0.75	−1.15	1.5	NS
13.	B perp-Pogperp (mm)	9.40	9.50	−0.318	NS
14.	ANS-A perp (mm)	8.70	8.60	0.318	NS
15.	FH/N-Pog (°)	89.70	89.30	1.177	NS
Jaws (vertical) parameters					
16.	SN-MP(S) (°)	25.70	26.00	−1.406	NS
17.	N-Me (mm)	124	124	−1	NS
18.	S-Go (mm)	87.90	87.40	1.627	NS
19.	N-ANS (mm)	58	58	0.532	NS
20.	ANS-Me (mm)	68.40	68.40	0	NS
21.	Jarabak ratio (%)	70.92	70.70	0.588	NS
22.	N-ANS (%)	45.7	45.5	0.802	NS
23.	ANS-Me (%)	55.07	55.55	1.65	NS
Dental parameters					
24.	IL(i)-MP(T) (°)	88.30	88.30	0	NS
25.	IL(s)-PP (°)	66.70	66.60	0.429	NS
26.	IL(s)-SN (°)	107.10	106	1.206	NS
27.	IL(s)-IL(i) (°)	136	135	0.818	NS