

Evaluation of Holdaway's Soft Tissue Analysis in Jharkhand Population

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ABSTRACT

Background: This study is to compare and evaluate the soft tissue changes in Jharkhand population. This study evaluates the soft tissue analysis according to the standard Holdaway's norms in comparison to other populations.

Material and Methods: The lateral cephalometric radiographs of 80 healthy individuals [40 males & 40 females] were retrieved. Soft tissue and skeletal features were traced on acetate sheets using the HOLDAWAYS soft tissue analysis craniographic methods.

Result: The soft tissue profile of these subjects was found to be more protrusive when compared to the Caucasian subjects, as indicated by the highly significant increase in the H line angle soft tissue facial angle, nose prominence.

Conclusion: The following results were apparent that Soft tissue pattern of the males of the Jharkhand population was found to be protrusive when compared to female adult, and adults have more protruded upper lip position and a more convex profile. Females have a thin upper lip and soft tissue chin thickness than males.

Keywords: HOLDAWAYS soft tissue analysis, Linear parameter, Skeletal parameter, H Line.

INTRODUCTION

A number of lines across the soft tissue profile have been advocated as helpful in accessing facial balance and soft tissue proportions of these; perhaps the most useful is the Holdaway line; from the most anterior point on chin across the anterior point of the upper lip and extending across the nose¹. The goal of the diagnostic process is to produce a comprehensive description of the patient's problems and to synthesize the various elements of the description into a rational problem list. The problem list in turn; leads logically to the

treatment plan². Holdaway emphasized that "Understanding how important is the psychological development of young persons and how their social development is related to attractiveness and favourable self-image, it is imperative that we take very seriously the matter of giving our patients the best possible balance and harmony of facial lines". Several attempts have been made to investigate the differences in the faces of various ethnic groups including Caucasian, Mexican American, Chinese, Japanese, Korean, Puerto Rican and Turkish³⁻²⁰.

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Holdaway¹⁷⁻²¹ outlined the parameters of soft tissue balance. Briefly, his analysis comprises 11 measurements: facial angle, upper lip curvature, skeletal convexity at point A, harmony line (H- Line) angle, Pn to H-line, upper sulcus depth, upper lip thickness, upper lip strain, lower lip to H-line, lower sulcus depth, and chin thickness. Holdaway emphasized the importance of quantitating soft tissue features in orthodontic treatment. He noted that "Usually as we correct malocclusion, we bring about changes in appearance that are pleasing to all concerned. However, most orthodontists who have practiced for even a few years have had the unpleasant experience of finding that some patients face looked better before the orthodontic corrections were made". (Holdaway 1983). Better treatment goals can be set if we quantitate the soft tissue features which contribute to or detract from that "physical attractiveness stereotype" which has been ingrained into our culture. The need to improve treatment goals for our patients is the primary reason for this soft tissue analysis¹².

Aim and Objective:

The aim of the present study is to compare and evaluate the soft tissue changes in Jharkhand population. This study evaluates the soft tissue analysis according to the standard Holdaway's norms in comparison to other populations. This article presents a soft tissue analysis which demonstrates the inadequacy of using a hard tissue analysis alone for treatment planning.

MATERIAL AND METHODS

The present study was carried out at the department of Orthodontics and Dentofacial Orthopaedics, Awadh Dental College & Hospital, Jamshedpur.

Material used:

1. Pre-treatment lateral Cephalograms of the subject selected.
2. 0.003- inch acetate matte tracing paper and 3H pencil for tracing.
3. For linear measurement divider and scale up to 0.5 mm correction.
4. For angular measurement protractor up to 0.5° correction.
5. Tracing table well illuminated.
6. Radiographic View Box 7.X-Ray Machine

Method: The lateral view of each patient was obtained using a standardized cephalometric technique. The radiographs were recorded in NHP position with Frankfort Horizontal plane parallel to the floor and teeth in occlusion.

SOURCE OF DATA: The lateral cephalometric radiographs of 80 healthy individuals [40 males & 40 females] in the age range 20-45 years were retrieved from the department of orthodontics, Awadh Dental College and hospital, Jamshedpur (JHARKHAND). Soft tissue and skeletal features were traced on acetate sheets using the HOLDAWAYS soft tissue analysis craniographic methods.



Fig 1: Extra oral photograph of female.



Fig 2: Extra oral photograph of male.



Fig 3: Intra oral photograph of female.



Fig 4: Intra oral photograph of male.



Fig 5: Tracing table.



Fig 6: Tracing materials.



Fig 7: Standardized procedure for obtaining cephalogram.

Inclusion Criteria:

1. Jharkhand Indian population: The Jharkhand origin of the patient was ascertained by following family lineage up to 3 generations.
2. Individuals with good balance and harmony of dentofacial structures with no history of orthodontic treatment/orthognathic surgery were included.
3. Subjects were 20-45 years of age.
4. Subjects had full complement of teeth except for 3rd molar.
5. No apparent dental or skeletal discrepancies.
6. Angle Class I occlusion with minimal or no crowding.
7. Normal overjet and overbite.

Exclusion Criteria:

1. Subjects who had already undergone orthodontic treatment.
2. Subjects with any congenital abnormality.
3. Subjects who had undergone any facial or orthognathic surgery.

Statistical Tools:

The obtained data was fed into the computer and statistical analysis was done for the same using the

software “Statistical Package for Social Sciences” for windows (version 17.0)/ MATLAB analysed accordingly.

RESULTS

Table 1: Measurements used in this study.

Measurement	N	Minimum	Maximum	Mean	Std. Deviation
Soft tissue facial angle	80	84.00	96.00	89.91	3.30
Nose prominence	80	7.00	18.00	13.05	2.68
Superior sulcus depth	80	.00	6.00	3.25	1.57
Soft tissue subnasale to H-line	80	2.00	10.00	6.25	1.92
Skeletal profile convexity	80	-4.00	5.00	0.64	1.96
Upper lip thickness	80	13.00	21.00	16.26	1.96
Upper lip strain	80	12.00	20.00	15.2	2.44
H angle	80	8.00	25.00	17.07	3.41
Lower lip to H-line	80	-2.00	4.00	0.84	1.47
Inferior sulcus to H-line	80	1.00	10.00	5.26	1.94
Soft tissue chin thickness	80	9.00	16.00	12.29	1.81

Table 2: Mean and standard deviation of cephalometric measurement for Jharkhand adult population

Measurement	Caucasian norms	Jharkhand norms		Test of significance
		Mean	Std deviation	
Soft tissue facial angle	91+/-7 degrees	89.9125	3.300149	<0.001
Nose prominence	14 to 24 mm	13.05	2.68092	<0.001
Superior sulcus depth	1 to 4mm	2.9667	2.70315	0.16355267 NS
Soft tissue subnasale to H line	3 to 7mm	6.25	1.92584	<0.001
Skeletal profile convexity	-2 to +2mm	0.6375	1.96323	0.01842967
Upper lip thickness	13 to 14mm	16.2625	1.960004	0.00165751
Upper lip strain	No norms	15.2	2.441207	0.01410473
H-angle	7 to 14 degrees	17.075	3.411725	<0.001
Lower lip to H-line	1 to 4mm	0.8375	1.47076	0.0079078
Inferior sulcus to H-line	No norms	5.2625	1.94704	<0.001
Soft tissue chin thickness	10 to 12 mm	12.2875	1.8155	<0.001

DISCUSSION

The soft tissue profile of these subjects was found to be more protrusive when compared to the Caucasian subjects, as indicated by the highly significant increase in the H line angle soft tissue facial angle, nose prominence. The present study highlights the fact that, the excellence of facial

pattern is peculiar to its racial group and such variations are of relative significance when planning our treatment objectives. Soft tissue pattern of the males of the Jharkhand population was found to be protrusive when compared to female adult. The Jharkhand population has a protrusive profile as

indicated by an increase in the values of H angle and upper lip thickness.

CONCLUSION

From the present study following conclusion were made:

1. There was statistical difference between soft tissue facial angle for Jharkhand population when compared to Caucasian population.
2. The nose prominence in Jharkhand population was found to be less prominent statistically when compared to Caucasian population.
3. The upper lip curl (superior sulcus depth) was statistically non-significant in Jharkhand population when compared to Caucasian population.
4. The soft tissue sub-nasale to H line showed more upper lip curvature statistically when compared to Caucasian population.
5. There was statistically significant difference between skeletal profile convexity for Jharkhand population when compared to Caucasian population. In our study we found increase in value of skeletal convexity than Caucasian this indicates more convex profile and protrusive upper lips.
6. The soft tissue chin thickness and upper lip thickness values are less when compare Caucasian population. This showed thin, soft tissue covering.
7. The soft tissue H line angle in Jharkhand population was found to be more prominent statistically when compared to Caucasian population showed protrusive upper lip.
8. There was statistically significant difference between lower lip to H line for Jharkhand population when compared to Caucasian population.
9. Upper lip strain measurement and inferior sulcus to H line showed significant increase in accordance with Caucasian group.

This study demonstrate that the Holdaways soft tissue analysis is useful to assess the soft tissue in regular clinical practice.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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