International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2019): 7.583

Evaluation of Gender Differences of Holdaway Soft Tissue Profile Parameters of Jordanian Adults; Experience at Princess Haya Bint Al-Hussein Military Hospital in Ajloun, Jordan

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Abstract: ***Objective: To establish normal data of the facial soft tissue of the Jordanian adults and to compare male with female values. This could be helpful for both the clinicians and researchers in the field of orthodontics. Method: This study conducted on a sample comprised of subjects (50 females and 50 males) who attended an orthodontic clinic at princess Haya Bint Al-Hussien military hospital in Ajloun, Jordan for various reasons. Age was on average from (18-25) years. The sample was chosen randomly over a period of one year. For each participant a standard lateral cephalogram radiograph was taken. Result: A total of 100 lateral cephalogram radiographs were analyzed. The data showed that H angle is larger in male adults than females; indicate that facial convexity is more in male adults. While the total nose prominence and the lower lip showed insignificant gender differences in our sample. Conclusion: Holdaway found that orthodontic treatment goals were much improved when soft tissues features were taken into account during treatment planning.***

Keywords: cephalometric standard norms, Holdaway

1. Introduction

Facial esthetic and functional occlusion are usually the essential objectives in orthodontic treatment, so, knowledge of normal dentofacial pattern of various ethnic groups is important for clinical and research purposes.Thus, soft tissue analysis of the face is a major component in the diagnoses and treatment planning of orthodontics and dentofacial orthopedic cases (1).

Thegenetic, epigenetic and environmental factors play an important role in the normal development of craniofacial complex and its soft tissue covering it. (2)

As this would affect the psychological development of young person, Holdaway (1983) has further stressed the implementation of proper soft tissue relations to provide patients with the best possible harmony of facial lines (3)

Thus, many authors have emphasized the importance of incorporating soft tissue analysis during the process of diagnosis (Spradle et al., 1981, Owen, 1984, Park and Burstone, 1986). (4, 5, 6)

The H angle allowed a few degrees for soft tissue thickness variability, which must increase as the basic skeletal convexity increase. (3)

Bishara et al studied the soft tissue profile changes between the ages of 5 and 17 years and concluded that, the two angles which represent the facial convexity (H and Z angles) do not behave in a similar manner with age. And documented that; the clinician needs to use different soft tissues parameters to better evaluate the soft tissue profile. (7)

In a sample consisting of 81 North Mexican and 35 Iowa adolescent boys and girls (12-14 years),it was observed that Holdaway soft tissue angle was larger in boys than in girls indicating a more convex soft tissue profile for the boys at this age.(8)

The anteroposterior growth of the nose in males and females is continued after skeletal growth had subsided. Females had concluded a large proportion of soft tissue development by the age of 12 ,while in males continued growth was noted until age 17 years.(9)

Regarding the gender differences in profile, significant differences in dentofacial parameters were found between males and females with the same facial type. The differences among facial types were not identical in males and females. (10)

2. Methods

This study was conducted at the dental department of princess Haya Bint Al Hussien military hospital in Ajloun, Jordan who attended an orthodontic clinic for various reasons.

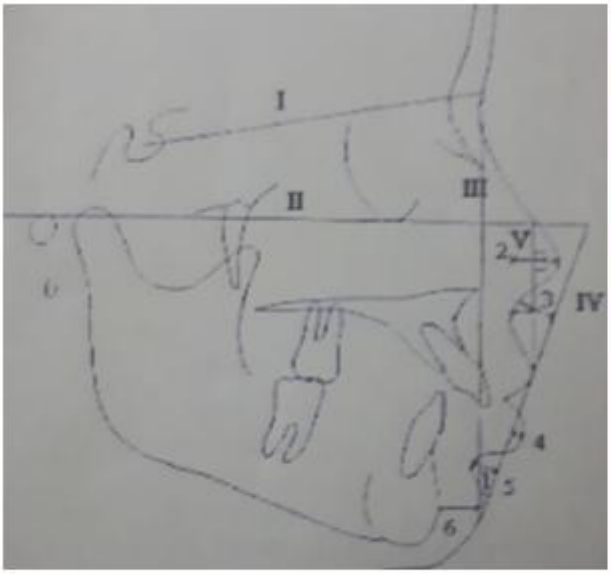
A total of 100 lateral cephalometric radiographs of Jordanian subjects (50 females and 50 males) with ages that ranged from 18-25 years were selected randomly over a period of one year. With regarding to the geographic origin as all from North region of Jordan.

The sample met the following criteria: no significant medical history or history of trauma, class I molar and canine relationship for both sides, skeletal class I as proved from the lateral cephalogram, and no rotations, no spacing, no crowding. Lips at rest were competent without straining of mentalis muscle, normal overjet and normal overbite, no previous orthodontic treatment.

All lateral cephalogram radiographs were taken with the lips at rest and the teeth in occlusion with the head in correct head position.as indicated by both the ear rods and head supporting device.

The following measurements were recorded with reference to Holdaway soft tissue analysis. (Figure 1):

- H angle.
- Nose: total nose prominence was measured.
- Upper lip sulcus.
- Lower lip.
- Lower lip sulcus.
- Chin (soft tissue).



Cephalometric tracing showing the soft tissue measurements

Lines and parameters used in this study.:
I: the sella-nasion line.
II: Frankfort horizontal plane (FH).
III: soft tissue facial line; from soft tissue nasion to the point on the soft tissue chin overlying Ricketts supra pogonion.
IV: the H line or harmony line; drawn tangent to the soft tissue chin and the upper lip.
V: A line running at a right angle to the Frankfort plane down tangent to the vermilion border of the upper lip.

1. H angle
2. Total nose prominence.
3. ULS.
4. LL.
5. LLS.
6. Chin.

The data were collected tabulated, and both genders were compared by t-test to find the gender differences in profile parameters.

3. Result

Table 1 shows the descriptive statistics of the Holdaway's variables studied for 100 subjects.

While the statistical analysis revealed highly significant differences between both sexes regarding H angle, upper lip sulcus and the chin, while the position of the lower lip and the total nose prominence were very close and the gender differences was insignificant.

Table 1: Soft tissue configuration of female and male Jordanian adults using t-test

Variable	Jordanian male adults (n=50)			Jordanian female adults (n=50)			t-test value
	Mean	s.d	s.e.m	mean	s.d	s.e.m	
H angle(◦)	18.9	2.94	0.537	15.5	2.9	0.529	-5.11**
Nose (mm)	14.93	1.7	0.311	15.98	2.25	0.411	1.74
U.L.S (mm)	6.95	2.09	0.381	5.3	1.11	0.202	-3.54**
L.L (mm)	1.61	0.83	0.151	1.11	1.38	0.251	-1.53
L.L.S (mm)	4.27	1.14	0.207	3.8	1.36	0.248	-1.34
Chin (mm)	13.17	1.4	0.256	11.91	1.07	0.196	-3.64**

s.d: standard deviation
s.e.m: standard error of the mean.
n: number of cases
**: highly significant (p value ‹0.01)

4. Discussion

Harmonious facial esthetics and function have long been recognized as two of the goals of orthodontic treatment. To accomplish these goals, knowledge of normal cranio-facial growth is essential. As improvement in facial esthetic is one of the most important objectives in any kind of orthodontic treatment, the knowledge of soft tissue pattern and its normal relationship in various ethnic groups is important for both clinical and research purposes.

The present study was designed to find the gender differences in normal facial profiles in Jordanian adults to help orthodontists in their treatment planning of their cases.

H angle was found in this study to be larger in male adults than in females. Which indicated that, male adults have increased facial convexity more than in females. This result was consistent with other studies done on other populations like Singaporean Chinese population, Turkishpopulation, and Egyptian.

Upper lips in Jordanian male adults, as well as, the chin showed greater values than in female adults. While the total nose prominence and the lower lip showed insignificant gender differences in oursample. These results showed the differences in profile preferences between the two genders. For males the convex profile with more prominent chin is considered acceptable. But in females the less convex profile with full lower lip and less protruded chin are the normal facial features. These results were identical with other studies regarding the presence of gender differences.

Many studies were carried out in different countries to establish specific tissue norms for their populations, or to compare their norms with other populations, in order to use the related norms in treatment planning of their cases from different origins.

From this study it could be safely said that the soft tissue can vary in many ways and still be in balance and harmony according to racial, genetic, geographic and gender differences within normal skeleto-dental pattern.

5. Conclusion

- Male adults had a more prominent upper lip in relation to the overall soft tissue profile compared with females.
- The lips of female subjects were considerably more retrusive in relation to the nose and chin, while those of males were slightly more protrusive.

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