

ORIGINAL ARTICLE

Soft Tissue Lip Profile with Steiner(S) and Ricketts (E) Lip Analysis in Patient's with Skeletal and Dental Class I Occlusion

ALMAS RAHOOJO¹, SAMREEN NAZ², MANSOOR AHMED RAHOOJO³, ABDUL BARI MEMON⁴, SANDEEP⁵, ALI MUHAMMAD RAHOOJO⁶

¹Assistant Professor, Orthodontic department, Bibi Aseefa Dental College Larkana

²Assistant Professor, Oral and Maxillofacial Surgery Department of Bhitai dental & Medical College Mirpur-Khas

³Resident at Oral and Maxillofacial Surgery Department, LUMHS Jamshoro

⁴Associate Professor, Community dentistry Department Bibi Aseefa Dental College Larkana

⁵Senior registrar, Dental material department, Bibi Aseefa Dental College Larkana

⁶Senior lecturer at Bibi Aseefa Dental College Larkana

Corresponding author: Almas Rahoojo, Email: almasrahoojo@yahoo.com

ABSTRACT

Objective: To determine the soft tissue lip profile with Steiner (S) and Ricketts (E) lip analysis in patients with skeletal and dental class i occlusion at LUMHS

Methodology: This descriptive study was done at department of Orthodontic, Liaquat University of medical and health sciences Jamshoro/Hyderabad, from august 2014 to august 2015. Individuals having age range of 18–30 years with dental and skeletal occlusion class I, competent lips involving facial profile, without history of preceding orthodontic treatment, mal and crowded aligned teeth and either of gender were included. To evaluate hard soft and tissue lip profile, the cephalometric analysis was done using radiographs, traced manually on matte acetate sheets with thicknesses of 0.003, measurements of 8x10 under direct inspection on an illuminator. SPSS version 26 was used for data analyzed.

Results: A total of 100 patients were enrolled in the study their average age was 22±1.2 years. Males were 41% and females were 59%. The overall average of SNA angle was 81.866±1.199 and average of SNB angle was 80.667 ±1.27. Average of ANB angle, S line to upper lip, S line to the lower lip and E line to upper lip were 1.167 ±1.028, 1.067 ±1.006 mm, 1.917±1.369 mm, and 3.2±1.96 mm, respectively, while average of lower lip was 2.80±2.83.

Conclusion: In terms of soft tissue lip profile with Ricketts (E) and Steiner (S) lip analysis among patients with dental and skeletal occlusion class I, the Antero-posterior position of lower and upper lip regarding E-line was 2.80 +2.83mm and 3.2±1.96 mm, respectively, and Antero-posterior position of lower and upper lip regarding S-line was 2.16±1.34mm and 1.30±1.019 mm, respectively. According to gender, there was statistically no significant variance.

Keywords: Lip profile, skeletal, dental, occlusion class I

INTRODUCTION

Enhancement of facial aesthetics and a better functional occlusion is among the most relevant aims of orthodontic care.¹ The assessment of soft tissue profile of patients remains among the most essential aspects of orthodontic care and management planning.^{1,2} For orthodontists, it is also necessary to consider the full effect that treatment can have on their patients' facial aesthetics. Diagnosis in orthodontic practice is calculated partly by contrasting the cephalometric values of the patients to the standard measures. As being the most significant trait in assessing appearance, orthodontists have concentrated on horizontal lip arrangement for a longer duration.³ By drawing a line (S line) between the sub-nasal and nasal tip to the soft tissue pogonion from the midpoint of an S-shaped curve, Steiner focused on determining the soft tissue profile and indicated that the base line must be touched by the lips. Ricketts lip evaluation comprises of an E-line drawn from nasal tip to the soft tissue pogonion, Ricketts stated that 2 and 4 mm of mean distance between lower and upper lips respectively lies behind E-line.⁵ Several variables, including race, malocclusion and gender, influence the composition of soft tissue. The majority of typical cephalometric criteria are established on the sample population of individuals of European-American origins, considering potential ethnic variations.³⁻⁶ There is change in lip thickness and length in

terms of age that arise at various times among girls and boys. Mamandras investigated lip thickness while growth and observed it occurs earlier among girls at the age of 14 years, while among boys at the age of 16 years.⁷ All these findings have shown that for each race or ethnicity, normal dimensions for particular groups cannot be deemed acceptable. It is important to treat various ethnicities as per their own characteristics, it is therefore crucial to establish criteria for different populations that facilitate in the diagnostic and therapeutic interventions of orthognathic or orthodontic surgical procedure.⁷⁻⁹ A diagnosis is mainly established in orthodontic practice by evaluating the cephalometric values of a patient with standard values.¹⁰ Though, lateral cephalometric criteria can be unique to an ethnicity and cannot always be extended to other ethnicities.¹¹ Because a large majority of evidence has been undertaken on Caucasians, efforts have been made to examine the variations between different ethnicities. Pakistan has limited number of studies on cephalometric requirements without particular consideration taken into account for soft tissue profile evaluation.¹² In the last few years, orthodontic management & diagnosis planning has moved to facial planning.¹³ Macro-, mini- and micro-esthetics have been highlighted as well as orthodontic ethics are being concerned with enhancing the alignment of the nose-lip-

chin.¹⁴ One of the key factors in treatment preparation are maintaining balance of lip in 3 dimensions: Incompetence, Prominence, Strain, and Fullness of Lip Limited Philtrum height, Acute Labio-mental and Nasio-labial angles push treatment choice in Borderline cases towards extraction.¹⁵ Numerous base lines have been developed in photographic and cephalometric studies to determine the anteroposterior orientation of the lower and upper lips.¹⁶ Orthodontists, though have a base line in assessing lip positions among patients for their particular preferences. The two widely used base lines in orthodontic diagnostic and therapeutic preparation are the S-Line and E-Line. In order to determine the anteroposterior location of the lower and upper lips and the aesthetic consistency of the profile, several analyses have been implemented. In patients with dental and skeletal class I occlusion, our study was on the evaluation of the horizontal soft tissue lip profile with the Ricketts and Steiner lip examination. Different studies have been conducted globally, but no research has been conducted in our population to determine soft tissue lip profile standards in the dental and skeletal class I occlusion and to identify potential gender variances. This study aimed to evaluate the lip profile of soft tissue in the cases having molar and skeletal occlusion (class I), among individuals presented at Liaquat University of Medical and Health Sciences OPD.

MATERIAL AND METHODS

This was a descriptive study and was done at the Orthodontic department of Liaquat University of Medical and health sciences Jamshoro/Hyderabad. From August 2014 to August 2015, the study period was 6 months. Enrolled patients were aged 18–30 years, with dental and skeletal class I, competent lips involving facial profile, no history of prior orthodontic treatment, mal-aligned and crowded teeth, and either gender. Subjects with class II and III skeletal, division I and II dental class II, defective lips, bimaxillary proclinations and any congenital defects were excluded. Detailed history as well as clinical extra oral and intraoral examinations were carried out, following the explicit consent of the patients. To evaluate soft tissue and hard tissue lip profile, all cephalometric radiographs were manually traced on matte acetate sheets with thicknesses of 0.003 and measurements of 8x10 under direct observation on an illuminator. First, tracing was accomplished by defining, locating and marking all points of reference, then joining these points of reference to form planes. SNA-Angle: sella (S) reference point was linked to point A and point nasion (N), these 3 reference points align to define SNA angle SNB-Angle: angle: sella (S) point of reference was linked to point nasion (N) and 3 points of reference join point Bathes to form SNB angle. ANB-Angle: the variance between SNB and SNA. E-Line; It's a tangent line created by joining the soft tissue pogonion with pronasale. S-Line: A line created by joining points between the subnasale and the pronasale and the pogonion at the center of the "S" shaped curve. Calculations were recorded with scaler and D upon making these reference planes, and all readings were recorded on proforma and the same process was replicated from each patient and documented on proforma, and randomized cephalometric tracing was replicated following every 2

months to prevent errors in operator tracing. Data was analyzed via SPSS version 20.

RESULTS

A total of 100 cases were studied and the average age of the participants was 22+1.2 years. Females were 59% and males were 41% with male-to-female ratio of 1:1.4. Table. 1

The overall SNA angle average was 81.86+1.19, particularly 81.83+1.23 in males and 81.90+1.18 in females. The overall average of SNB angle was 80.66+1.27, followed by 80.60+1.354 in males and 80.73+1.201 in females. However, the mean of ANB angle was 1.16+1.12, followed by 1.23+1.021 in males and 1.10+1.120 in females. Table. 2

The overall mean of S line to upper lip in our population was 1.06+.006mm, including 1.30+0.95 in males and 0.83+1.01 in females. Average of S line to lower lip was 1.91+1.36mm, followed by 2.16+1.36 in males and in females 1.66+1.34. Average of the E line to upper lip was 3.2+1.96 while lower lip was 2.80+2.89. Table No:3

Table 1: Age and gender statistics of patients n=100

Variables	No. of patients (%)		
Age groups	18-25 years	83	83.0%
	26-30 years	17	17.0%
Gender	Male	41	41.0%
	Female	59	59.0%

Means Age 22+1.2 years, Male: Female Ratio = 1:1.4

Table 2: Steiner SNA, SNB and ANB angle of study population n=100

Variables	Gender	Mean+SD
SNA angle	Male	81.83+1.23
	Female	81.90+1.18
Steiner SNB angle	Male	80.60+1.354
	Female	80.73+1.201
Steiner ANB angle	Male	1.23+1.021
	Female	1.10+1.120

Table 3: S line to upper and lower lips and upper and lower lips to E line of study population n=100

Variables	Gender	Mean+SD
S line to upper lip	Male	1.30+0.95
	Female	0.83+1.01
S line to lower lip	Male	2.16+1.36
	Female	1.66+1.34
Upper lip to E-line		3.2+1.96
Lower lip to E-line		2.80+2.83

DISCUSSION

The goal of improving face aesthetics has quickly become one of the most desirable outcomes of orthodontic treatment, and the concept of normal has become essential to an orthodontist. Tweed described normal as 'the balance and harmony of dimensions considered most pleasant in the human face by the majority of us'.¹⁷ Moreover, because different races have varied patterns in soft tissue, skeletal structures and dental, it is necessary to identify norms for diverse ethnic groups of the population in order to provide accurate diagnoses and treatment plans.¹⁷ In this study, the

average age of the participants was 22+1.2 years and females were in the majority of 59% and males were 41%. However, 31 (51.6%) males and 29 (48.33%) females were identified in the research undertaken by Abdul-Qadir MY.¹⁸ In the study of Ahmad F et al¹⁹ reported that the average age of the individuals was 21.7±1.3 years with age range of 18 to 23 years. In this age category, a marginal level of development is projected.

In current study the analysis indicates of sagittal skeleton the sample was found to be in Class-I as seen the by values of SNA angle as; overall SNA angle average was 81.86+1.19, particularly 81.83+1.23 in males and 81.90+1.18 in females. Although in the study of Hameed A et al²⁰ demonstrated the anteroposterior link of maxilla and the mandible to cranial base as found via SNA angle as 81.45° ± 2.80 and the SNB angle 77.11°±3.39.

In this study the overall average of SNB angle was 80.66+1.27, followed by 80.60+1.354 in males and 80.73+1.201 in females. Consistently Gasgoos SS et al²¹ conducted a study on the identification of the cephalometric features of 3 skeletal jaw relations (malocclusion class I, class II and Class III) and they demonstrated that the average of SNA angle 81.734 ± 0.322 in class I, 82.765 ± 0.480 in class II and 78.694 ± 0.446 in class III. In another study of Ahmed AA et al²² also reported that the average SNA angle was 81.15+3.676, and average of SNB angle was 78.55+4.344 in the cases of skeletal class I and these findings were almost similar to this study.

In this study the overall mean of S line to upper lip was 1.06+0.006mm, and average of S line to lower lip was 1.91+1.36mm, average of the E line to upper lip was 3.2+1.96 while lower lip was 2.80+2.89. these can be compared the study of Prabhat KC et al²³ as Rickett's E line to upper lip 2.5 mm and lower lip to Rickett's E line 7 mm.

Our findings were compared with the study of Rasheed F et al²⁴ and it also was shown that dentoalveolar morphology and shape are affected by soft tissue position, which has a hereditary component. For appropriate diagnostic and treatment strategy in Class, I malocclusion instances, mechanics should be assessed while keeping racial variables in mind that can contribute to biting open in group of population.²⁴

CONCLUSION

According to the soft tissue lip profile with Steiner (S) and Ricketts (E) lip analysis in patients with dental and skeletal class I occlusion, the lower and upper lip antero-posterior position with respect to E-line was 2.80+2.83 mm and 3.2+1.96 mm, the lower and upper lip antero-posterior position with respect to S-line was 2.16+1.34 mm and 1.30+1.019 mm respectively. There was no significant difference according to gender. This study confirmed the concept that Pakistani population had distinct cranio-facial characteristics that must be carefully considered by orthognathic surgeons and orthodontists during setting objectives of the treatment.

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