DOI: https://doi.org/10.53350/pjmhs2023172286

ORIGINAL ARTICLE

Comparison of Mean Upper Lip Length in Individuals with Competent Lips, Lips Apart and Incompetent Lips

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ABSTRACT
Background: The human lips are the essential structure for speech, facial expression and oral functions like eating, drinking and breathing. The orthodontic treatment is very crucial for the advancement of the facial expression Lip incompetence is a condition in which the lips fail to close adequately leading to negative effects on speech, facial esthetics and oral functions.
Study design: It is a retrospective study conducted at WATIM Dental College Rawat, Rawalpindi and Altamash Institute of Dental Medicine, Karachi for the duration of six months from Jan 2022 to June 2022.
Material and Methods: The patients were divided into three groups. The patients that did not follow the inclusion criteria were excluded from the study. Group I had patients with competent lips, group II had patients with their lips apart and group III had incompetent lips. There were 45 patients in each group.
Results: The length of group I members was 19.8 mm for men and 18.7 mm for women, which was less than group III individuals with 20 mm and 18.9 mm average upper lip length for males and females. Group II patients had a length of 17.5mm for male patients and 16.4 mm for female patients. The P-value was calculated and the results were statistically significant.
Conclusion: The length of group I members was 19.8 mm for men and 18.7 mm for women, which was less than group III individuals with 20 mm and 18.9 mm average upper lip length for males and females. Group II patients had a length of 17.5mm for male patients and 16.4 mm for female patients.
Keywords: Lip incompetence and competent lips.

INTRODUCTION

The human lips are the essential structure for speech, facial expression and oral functions like eating, drinking and breathing. The orthodontic treatment is very crucial for the advancement of the facial expression. The major difference that occurs between the laypersons and orthodontists is the perception. In various studies the factors are explained that are associated with the facial inducement[1-2]. The numerous studies have mentioned the factor that is necessary for the facial attractiveness is lips competency. As a result, determining the position of the lips in relaxation and the processing elements causing lips incompetency play a crucial role in the treatment of orthodontic patients. Lip competence, or the capacity to maintain a seal at bottom and during mechanism, is a crucial component in perfectly natural orofacial function and development. Lip incompetence is a condition in which the lips fail to close adequately leading to negative effects on speech, facial esthetics and oral functions. Individuals with incompetent lips require significant exercise of the lower lip as well as unconventional action of the tongue to shut the lips. Skeletal changes and different modulations take place in the case of incompetent lips and it also causes changes in the morphology of lips[3-4]. The terms foreseeably competent, pseudo-incompetent or the lips off are used to characterize the lips position when there is a small difference between the upper and lower lips. Lips apart at rest should not be more than 4mm apart for all ethnicities; anything more than that is considered incompetent lips. Individuals with competent lips have relatively short upper lip widths than those with lips apart or incompetent lips, according to research. Some studies produce disparate results because they are conducted in populations of various races. The fundamental limitation of this study is the cross-sectional nature of various parameters.[5-6] However, this study may aid in additional investigation to gain a better understanding of other perspectives on lip incompetence and upper lip length. A longitudinal study is required for a more accurate assessment of the relationship between upper lip length and lip incompetence. A shortened upper lip length is linked with a more attractive facial profile, better lip support, and better oral mechanisms such as swallowing and speech. Individuals with lips apart or incompetent lips have a relatively long upper lip length, which can result in a less attractive facial profile and compromised oral functions.[7-8] Previous research examined the relationship between various factors such as upper incisor inclination, overbite, incompetent lips and overjet.[9-10] However, no studies have been conducted to date that have evaluated the difference in upper lip length in people with distinct lip positions such as competent, incompetent, and with lips apart on pathological evaluation at lips repose while maintaining these factors are held constant. The purpose of this study was to figure out the average difference in upper lip distance in particular person with distinct lip location at rest.

MATERIAL AND METHODS

The patients were divided into three groups. The patients that did not follow the inclusion criteria were excluded from the study. Group I had patients with competent lips, group II had patients with their lips apart and group III had incompetent lips. There were 45 patients in each group. The data of every patients was collected. Records of each selected patient who visited the orthodontic department of the hospital was evaluated. The hospital review board committee approved the study. According to the data collected the patients were divided into three categories. Mean and standard deviation scores were calculated by applying ANOVA. According to the inclusion criteria following patients are included in the study:

- The patients with the age range from 12-19 years
- The patients with both genders are involved
- The patients with full dentition
- The patients with permanent first molar

According to the exclusion criteria following patients are excluded

- Individual with any orthodontic surgery
- Patients with any cosmetic lip lengthening treatment
- The patients with rhinoplasty
- The patients with anomalies of craniofacial region

RESULTS

The study was carried out to find the average upper lip length. This study provides information about the length of the upper lip in different classes of incompetent lips at different patterns. The

mean age of groups I, II, and III came out to be 28.5 ±8.5, 29.3 ±3.5, and 27.4 ±6.4 years respectively. Male patients were found less frequently than female patients with 34%, 41%, and 25% ratios in group I, II, and III respectively. There were 66%, 59%, and 75% females in groups I, II, and III respectively.

Table 1: General features of patients

Features	Group I	Group II	Group III
Mean age (years)	28.5 ±8.5	29.3 ±3.5	27.4 ±6.4
Gender (male)	(15) 34%	(18) 41%	(11) 25%
Female	(30) 66%	(27) 59%	(34) 75%

Table 2 shows the mean upper lip length of three groups both in the case of male and female patients. The length of group I members was 19.8 mm for men and 18.7 mm for women, which was less than group III individuals with 20 mm and 18.9 mm average upper lip length for males and females. Group II patients had a length of 17.5mm for male patients and 16.4 mm for female patients. The P-value was calculated and the results were statistically significant. Mean and standard deviation scores were calculated by applying ANOVA and results are shown in Tables 1 and 2.

Table 2: Mean upper lip length of three groups

Groups	Average upper lip length (mm)	Standard deviation (SD)	P-value
Group I			
Male	19.8mm	2.1	0.005
Female	18.7mm	2.3	0.003
Group II			
Male	17.5mm	2.4	0.000
Female	16.4mm	3.1	0.001
Group III			
Male	20mm	2.3	0.002
Female	18.9mm	2.0	0.005

DISCUSSION

For orthodontic diagnostics, there is a need for evaluation of the competency of lips. It plays a major role in the planning of treatment methods and here the incompetency of lips is deliberated as the pathology. If this situation is not treated for a very long time then it may lead to serious issues like open bite formation, and some inflammatory issues around the incisors[11-13]. By considering all the available data on the competency of lips, several studies described multiple factors involved in the incompetency of lips. Among these studies, a study highlighted the role of the morphology of dentofacial parameters incompetent and incompetent lips and compared both types. It was observed from the respective study that the height of lower and anterior facials raised and pogonion gets retro in position in case of incompetent lips of class II[14-15].

In a study about malocclusion, the lip length was estimated in different classes of skeletal occlusion. As a result, the malocclusion of class I had more lip length as compared to the other two classes II and III. A more significant difference was found between classes II and III and classes I and III.

Another study highlighted the effect on lateral cephalograms due to the dental and skeletal characteristics of incompetent lips. Due to incompetent lips gaps remains between labials, while shorter and thin upper and lower lips were observed. Skeletal changes and different modulations take place in the case of incompetent lips and it also causes changes in the morphology of lips.

All the studies described in the literature show the comparison of different dental, facial, and skeletal features with the incompetency of the lips. There was no study describing the difference in the upper lip length in the three groups of incompetent lips, also the comparison between male and female populations was not done in previous studies[16-17]. All of the above mentioned studies were from European and American countries, and Asian countries were not evaluated for incompetent lips. So this study aimed to evaluate the Pakistani population having incompetent lips, especially upper lip length studied in both male and female populations. In this study, the length of the upper lip at different positions was studied, while the other patterns like vertical, sagittal, and skeleton were kept constant. The difference in length was found in all three different patterns, but no significant difference in length was observed.

This study provides information about the length of the upper lip in different classes of incompetent lips at different patterns. Male patients were found less frequently than female patients with 34%, 41%, and 25% ratios in group I, II, and III respectively. The length of competent lips at different repose was also found but has not been mentioned in this study. Another study on the Nigerian population shows a significant difference in the length of the upper lip with regard to sexual dimorphism. Due to the difference in facial patterns and bone length in both male and female genders, anthropometric changes were also present which may lead to the difference in the length and width of upper lips. A statistically significant difference was observed in the length of the upper and lower lips of males and females[18-19]. While another study does not support this evaluation, according to them sexual dimorphism does not have any effect on the length of the upper lip. According to the estimations of this study, a statistically insignificant difference was observed in both the male and female populations.

Some of the studies show different results because they are carried out in populations of different races. The basic limitation of this study is the cross sectional nature of different parameters[20]. But this study may help in further studies for a better understanding of other perspectives related to the incompetency of lips and upper lip length. There is a need for a longitudinal study for a better evaluation of the relationship between the length of the upper lip and the incompetency of lips[21]. In this study, three different parameters were kept constant, but in other studies, these features can be studied by keeping only one parameter constant and the other two as variables for further comparison of lip length and incompetency of the lips.

CONCLUSION

The length of group I members was 19.8 mm for men and 18.7 mm for women, which was less than group III individuals with 20 mm and 18.9 mm average upper lip length for males and females. Group II patients had a length of 17.5mm for male patients and 16.4 mm for female patients. An insignificant difference in upper lips length was found among the male and female populations. Females have more incompetent lip issues. This is a cross-sectional study, there is a need for longitudinal research for the further evaluation of upper lip length.

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