Research Article

Lip length and its correlation among different age group and gender in Nepalese Population

Dr. Binam Sapkota,[1] Dr. Ujjwal Rimal,[2]

[1]Associate Professor, [2]Lecturer
Department of Prosthodontics,
Kathmandu University School of Medical Sciences, Dhulikhel, Nepal.

Corresponding author: Dr. Binam Sapkota; Email: binamsapkota_7@hotmail.com

ABSTRACT

Introduction: The Dentofacial composition includes the lips and the smile as they relate to the face which provide the valuable information to the clinician when evaluating smile esthetics.
Aims and objectives: To determine the relation of lip length and incisor visibility during rest and smile among different age groups and gender.

Materials and Method: A cross sectional study was done in 158 participants of age group between 19-40 years and above. They were seated in an upright position at rest. Then the lip length was recorded with a calibrated digital caliper measuring from subnasale to stomion superius and categorized into short, normal and long lips. Similarly maxillary incisor visibility was observed on rest and during full smile. The data obtained were then analyzed with SPSS software (version 22) and student- t test and ANOVA test was used to compare the measurements.

Results: It has been found that there is no significant of lip length in relation to gender and different age groups. Whereas average lip length has been found to be 21.2±2.3mm in male and 19.4±1.9mm in female. On the other hand significant difference is found in incisor visibility in different age groups and gender during smile.

Conclusion: Within the limitation of the study, a significant difference has been found in the incisor visibility when compared between gender and age groups in full smile whereas there is no difference in the lip length in male and female group.

KEYWORDS: Incisor visibility, Lip length, Subnasale, Stomion superius

INTRODUCTION

Anterior teeth play a crucial role in terms of esthetics and phonetics which enhances individual acceptances by improving interpersonal relationship during interaction with other fellow persons. Appearance is judged by numerous factors of which display of anterior maxillary teeth in harmony to facial characteristics such as lip mobility, lip length and gingival display.[1,2,3]

Prothero, Nicholas et al instructed to position the upper central incisor vertically so that 0-2 mm of the incisor edge is visible below the upper lip.[1] Upper lip length and lip mobility have a direct effect on dento gingival exposure at the rest and full smile.[4] The quantitative analysis of these two factors would provide valuable information to the clinician when evaluating smile esthetics.[5]

The selection of an appropriate maxillary anterior tooth is the most crucial and difficult aspects of complete denture fabrication. Similarly positioning of maxillary incisor edge during orthodontic treatment depends on lip dimensions.[6,7] A youthful smile is defined as full display of maxillary incisor crowns, with 1–2 mm of gingival margin. Usually, females tend to point out 1–2 mm more of gingival tissue than males. Recently, Silberberg et al showed that about 10% of their study population, aged between 20–30 years old, had gummy smiles, which were more evident in females than males, by a 2:1 ratio.[3]

Understanding the lip morphology and mobility can often be helpful while discussing esthetic outcomes of dental procedures to the patients so that their expectations may be met realistically. Upper lip can have an excellent impact with reference to smile, which is why its proportional length and thickness is to be determined to create an esthetic smile. There are various ways of measuring the length of the upper lip. The upper lip length is often measured between subnasale (Sn) point and superior stomion (Sts) point and various measurements have been suggested.[2,8] One study quotes it to be in the range of 22±2 mm in Caucasian adult male and 20±2 mm in a Caucasian adult female.[9] Heartwell CM[6] evaluated the correlation between lip length and teeth exposure and concluded that the vertical positions of the central incisors were primarily determined by their relationship with the lip in repose no matter the age and sex.[5]

Hence the primary objective of this study was to determine the average dimension of upper lip length in Nepali population. Secondary objectives are to compare the lip length and incisor visibility during rest and smile among different age groups and gender. The author is unaware of the similar type of study done in Nepali sample. It would be useful to describe some average desirable characteristic features of smiles to help achieve optimum results in esthetic oral rehabilitation.[8]

MATERIAL AND METHOD

A cross sectional study was done in 158 participants including staff and students attending the Department of Prosthodontics, Dhulikhel Hospital with age group between 15-40 years and above. Approval was obtained from Institutional Review Committee, KUSMS to conduct the study. Participants having caries, restoration, abrasion, attrition, malocclusion and crowns in anterior teeth and having history of congenital abnormalities, lip trauma, or orthodontic surgery were excluded from the study. After screening all the subjects were informed about the study and written consent was obtained.

They were seated in an upright position without the use of headrest, with eyes forward and normal mouth closure, the participant was asked to say word 'emma' and relax his/her lip and lower jaw. Now the lip length was recorded with a calibrated digital caliper (fig 1) measuring from subnasale to stomion superius (fig 2) (the distance between the base of the nose to the most inferior point at the center of the upper lip) and categorized as 18-22mm normal in female, below is short and above is long lip. 20-24mm normal for male, below is short and above is long lip.[8] Similarly maxillary incisor visibility was observed on rest (fig 3 and during full smile fig 4. Incisor visibility was coded as not visible, incisor third, middle third, cervical third and gummy smile. These measurement was done by the single examiner. The data obtained from these measurements were separated according to the age and sex and then analyzed with SPSS software (version 22) and student t-test and ANOVA test was used to compare the measurements.

Fig 1: Digital Vernier caliper

Fig 2: Male subject displaying the measurement with digital Vernier caliper from subnasale to stomion

Fig 3: incisor display of patient at rest

Fig 4: patient with full smile

RESULTS

A total of 158 participants of 19-40 years of age group were included in the study in which 36 were male and 122 were female. The gender distribution showed more females than male.

The frequency of upper lip length of the total sample in male and female is shown in Table 1 and 2 respectively. Average lip length was 21.2±2.3 mm in male and 19.4 ±1.9mm in female (Table 3). Paired t-test shows no significant difference in lip length in relation to gender and different age groups (p=0.264 and 0.322 respectively) (Table 3 and Table 4 respectively).

The gender distribution in incisor visibility during smile and at rest is shown in fig 5 and fig 6. Significant difference (p=0.033 and 0.001 respectively) in maxillary incisor visibility is seen when compared between genders during smile and rest (table 5). One way ANOVA shows maxillary incisor visibility during smile to be statistically significant (p= 0.033) among different age groups.

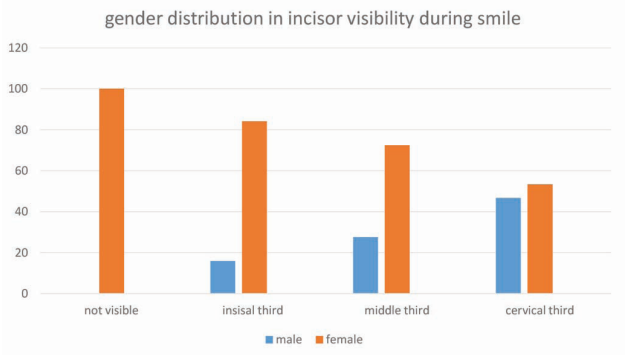

Fig. 5

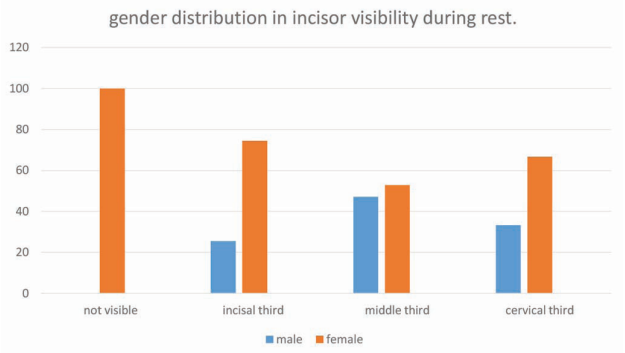

Fig. 6

Table 1: Lip length (male)

	Frequency
Short lip	11
Normal	22
Long lip	3
Total	36

Table 2: Lip length (Female)

	Frequency
Short lip	29
Normal	83
Long lip	10
Total	122

Table 3: Average lip length (paired t-test value)

	Lip length	P -value
MALE	21.23 2.3mm	0.264
FEMALE	19.45±1.9mm	

Table 5: Maxillary incisor visibility

	Male Mean	Female Mean	P value
Rest	1.16±0.73	1.54±0.65	0.033
Smile	2.72±0.51	3.15±0.61	0.001

DISCUSSION

The most common reason for seeking prosthodontic and orthodontic treatment is function as well as dent facial esthetics. The smile is a result of the interaction of various components that form the smile[10] of which position and dimension of incisor teeth have pivotal role. Incisor display is affected by the lip curtain and its characteristics are the length and mobility. Thus the current study aims to determine the maxillary lip length and its correlates between gender and age distribution. Study done by G Vig, G C Brundo shows significant difference in the upper lip length and amount of tooth exposure between individuals with normal and short lip length.[11] This finding is in contrast to the present study where there is no significant relation of lip length with gender and tooth visibility.

Further a significant difference in upper lip length has been noted between the genders with females having shorter lip than male in the study done by S Peck, L Peck et al.[12] which is also contradictory to our study where we found gender having normal lip length more common.

We found significant difference in visibility of tooth according to gender during smile which is in contrast to the study done by S Padmasree, Bhanu Rekha et al, but similar results regarding visibility according to liplength.[1]

The result support the findings of Peck et al[12] who

stated that dentogingival exposure appears to be dependent on several factors like muscle capacity, excessive interlabial gap at rest and degree of overjet overbite. These along with gender and different age groups have strong influence on incisor visibility when smiling than with upper lip length. A study published by Mohammed Jasim et al concluded that lip length has no effect on smile line or incisor visibility which is similar to our study.[13]

Study by Wagar Jeelani et al concluded that upper lip length was found to be the strongest predictor of variations in maxillary incisor display[14] which is again contradictory to our result.

Contrasting results in regards to lip length and incisor visibility relationships, with previous studies may be due to the small sample size. Apart from this, varied sample including different racial groups could change the outcome.

CONCLUSION

1. Normal lip length has the highest frequency.
2. Lip length does not vary significantly with respect to gender and age groups.
3. Significant difference is present in incisor visibility during smile when compared between gender and within age groups.

ACKNOWLEDGEMENTS

We would like to thank Dr Sijan Poudeyl (Associate Professor, PDCH) for her support with statistical analysis.

OJN

REFERENCES

1. Padmasree S, Rekha, Rajesh S, Ranukumari A. Incisal show- A decrease with an increase in lines of life. Int. J. Sci. Study. 2016; 4(1):215-9.
2. Roe P, Rungcharassaeng K, Kan YK J, Patel RD, Campagni WV, Brudvik JS. The influence of upper lip length and lip mobility on maxillary incisal exposure. Am J Esthet Dent. 2012; 2:116-25.
3. Davis NC. Smile design. Dent Clin North Am. 2007; 51(2):299-318.
4. Philips E. The classification of smile patterns. J Can Dent Assoc. 1999; 65(5):252-4.
5. Lee JJ, Ridgway JM. Facial aesthetics: concepts & clinical diagnosis. Arch Facial Plast Surg. 2012; 14 (5):372.
6. Heartwell CM, Rahn AO. Syllabus of complete denture 3rd edition.1974; 224.
7. Alkhalaf M, & Al-Sabbagh R. An Evaluation Of Upper Lip Length And Thickness Changes On Smiling In Patients With Class I, Class II Div1, 2 Of Malocclusion According To Angle's Classification: Journal of orthodontics and endodontics.2015; 1(2): 16.
8. Prabu NM, Kohila K, Sivaraj S, Prabu PS. Appraisal of the cephalometric norms for the upper and lower lips of the South Indian ethnic population. J Pharm Bioallied Sci. 2012; 4 (Suppl 2):S136-8.
9. Al-Juboori MJ et al. The relationship between the lip length and smile line in a Malaysian population. A cross sectional study. Dent Oral Craniofac Res. 2017; 3(4):1-5.
10. Tjan A H L, Miller GD, The JG. Some esthetic factors in a smile. J Prosthet Dent. 1984; 51(1):24-8.
11. Fonseca RJ. Oral and maxillofacial surgery. Orthognathic surgery, vol 2. Philadelphia: saunders, 2000.
12. Vig RG, Brundo GC. The kinetics of anterior tooth display. J Prosthet Dent. 1978; 39(5):502-4.
13. Peck S, Peck L, Kataja M. Some vertical lineaments of lip position. Am. J. Orthod. Dentofac. Orthop. 1992; 101(6):519-24. 14.
14. Jeelani W, Fida M, Shaikh A. The maxillary incisor display at rest: analysis of the underlying components. Dental Press J Orthod. 2018; 23(6):48-55.