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Cheiloscopy – A Tool of Identification

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Abstract

lip prints are a constant anatomical structure and are absolutely unique to an individual and thus are an infallible means of personal identification. The present study was conducted in the Department of Forensic Medicine & Toxicology, on Undergraduate students (2015 batch) of Osmania. Medical College, Hyderabad, Telangana. Sample size comprised of 196 students (78 males &118 females) and aged between 17 and 20 years.In the present study, it was found that, Type I' lip pattern was most commonly seen among males i.e. 70 out of 78 individuals studied (90%) and among females also type I' lip print pattern was seen predominant i.e. 99 out of 118 individuals studied (84%).It was recorded that Type I' lip print pattern was found to be more frequent among both the genders followed by type I lip print patterns.The analysis of presence of lip print in each quadrant among 196 individuals shows that the most common lip print pattern is in Upper right quadrant (URQ) of male lip was Type I' 71 (91%), while among females these patterns are found to be 103 (87%).In upper left quadrant (ULQ) Type I' was found among 71 (91%) males, same as that of 1st quadrant, while in females it is 98 (83%).In lower left quadrant (LLQ) among the male lip Type I' [72 (92%)] was mostly seen, while in females it is same with type I' pattern of 99 (84%).In lower right quadrant (URQ) of male showed Type I' [68 (87%)], while among females type I' pattern [98 (83%)] was found.

Key words- *lip prints, type 1 pattern, upper right quadrant.*

Introduction

Lips are highly sensitive mobile folds, composed of skin, muscle, glands and mucous membrane. They surround the oral orifice and form the anterior boundary of the oral cavity. There are two different kinds of lip covering- skin or mucosa. When the two meet, a white wavy line is formed- the labial cord which is quite prominent in Negroes. Where identification is concerned, the mucosal area holds the most interest. This area, also called Kleint's Zone, is covered with wrinkles and grooves that form a characteristic pattern- the lip print. However, this is not the only area that deserves careful study. In fact, in cheiloscopy, one should also analyze lip anatomy, considering their thickness and position. The lips can be horizontal, elevated or depressed and, according to their thickness; it is possible to identify the following four groups:

1. Thin lips (common in the European Caucasian)
2. Medium lips (from 8 to 10mm, are the most common type)
3. Thick or very thick lips (usually having an inversion of the lip cord and are usually seen in Negroes) and
4. Mix lips (usually seen in Orientals)[1]

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Aims and Objectives

1) To determine the identity from lip prints.

2) To determine whether sex can be determined by lip prints.

3) To discover the most common pattern of the lip prints in the study group.

Materials and Method

Lip prints were collected from the subjects after obtaining their informed consent in the month of October

2015. Dark colored lip stick was used for printing over the rough surface of drawing chart. The subject was asked to rub his/her lips after application of lip stick. Prints were taken on the rough surface of drawing chart with centre portion of lips dabbed first and then pressing it uniformly to either side. Lip prints studied based on KAZUO SUZUKI and Y TSUCHIHASHI classification. For recording the finger prints, imprints of the fingers were taken on a plain white paper using ink pad. Observation of prints done by magnifying lens.

I) Inclusion Criteria

· Subjects willing to participate in the study and providing informed consent

· Subjects free from any active or passive lesions on their lips.

II) Exclusion Criteria

· Gross deformities of lips like cleft lip, surgical interventions, ulcers, traumatic injuries on lips, cracked lips.

· Known allergy to the lip stick ingredients.

III) Sampling Design- Purposive sampling technique

IV) Study Design –Observational study

V) Place Of Study- Department of Forensic Medicine, Osmania Medical College, Hyderabad.

Observations and Results

The present study was conducted to assess the quadrant wise and gender wise predilection of Lip print patterns. Lip print impressions were obtained from both males and females and were classified by Suzuki's classification. The distribution of lip print types in males and females in each quadrant were compared.

Table 1 depicts the overall results of the present study. The distribution of various types of lip prints in all the four quadrants of both males and females have been summarized here.

	Male	Female
Type I		
First quadrant	68 (87%)	92 (78%)
Second quadrant	67 (86%)	73 (62%)
Third quadrant	65 (83%)	79 (67%)
Fourth quadrant	67 (86%)	74 (63%)
Type I'		
First quadrant	71 (91%)	103 (87%)
Second quadrant	71 (91%)	98 (83%)
Third quadrant	72 (92%)	99 (84%)
Fourth quadrant	68 (87%)	98 (83%)
Type II		
First quadrant	56 (72%)	69 (58%)
Second quadrant	57 (73%)	79 (67%)
Third quadrant	58 (74%)	85 (72%)
Fourth quadrant	57 (73%)	77 (65%)

Cont.. **Table: 1 Distribution of Lip print pattern**

Type III		
First quadrant	39 (50%)	26 (22%)
Second quadrant	39 (50%)	31 (26%)
Third quadrant	37 (47%)	27 (23%)
Fourth quadrant	46 (59%)	28 (24%)
Type IV		
First quadrant	29 (37%)	13 (11%)
Second quadrant	20 (26%)	18 (15%)
Third quadrant	13 (17%)	6 (5%)
Fourth quadrant	18 (23%)	5 (4%)
Type V		
First quadrant	2 (3%)	---
Second quadrant	2 (3%)	---
Third quadrant	---	---
Fourth quadrant	2 (3%)	---

Common Lip patterns among study group in various quadrants

Table 2 shows the percentage distribution of the pattern of the lip prints on the total subjects of 196 (118 females and 78 males) in first quadrant. In males the most common lip print patterns are type I' (91%) followed by type I (87%), type II (72%), type III (50%), type IV (37%) and type V (3%). In females the most common lip print patterns are type I' (87%) followed by type I (78%), type II (58%), type III (22%) and type IV (11%). Type V pattern is absent in females.

Table 2: Lip prints in First Quadrant (LUQ)

Types	**Sex**	
	Male	**Female**
Type I	68 (87%)	92 (78%)
Type I'	71 (91%)	103 (87%)
Type II	56 (72%)	69 (58%)
Type III	39 (50%)	26 (22%)
Type IV	29 (37%)	13 (11%)
Type V	2 (3%)	0

Table 3 shows the percentage distribution of the pattern of the lip prints on the total subjects in second quadrant. In males the most common lip print patterns are type I' (91%) followed by type I (86%), type II (73%), type III (50%), type IV (26%) and type V (3%). In females the most common lip print patterns are type I' (83%) followed by type I (62%), type II (67%), type III (26%) and type IV (15%). Type V lip patterns are not seen in females

Table 3: Lip prints in Second Quadrant (RUQ)

Types	Sex	
	Male	Female
Type I	67 (86%)	73 (62%)
Type I'	71 (91%)	98 (83%)
Type II	57 (73%)	79 (67%)
Type III	39 (50%)	31 (26%)
Type IV	20 (26%)	18 (15%)
Type V	2 (3%)	0

Table 4 shows the percentage distribution of the pattern of the lip prints on the total subjects in third quadrant. In males the most common lip print patterns are type I' (92%) followed by type I (83%), type II (74%), type III (47%), and type IV (17%). In females the most common lip print patterns are type I' (84%) followed by type I (67%), type II (72%), type III (23%) and type IV (5%). Type V lip patterns are not seen both in males and females.

Table 4: Lip prints in Third Quadrant (RLQ)

Types	Sex	
	Male	Female
Type I	65 (83%)	79 (67%)
Type I'	72 (92%)	99 (84%)
Type II	58 (74%)	85 (72%)
Type III	37 (47%)	27 (23%)
Type IV	13 (17%)	6 (5%)
Type V	0	0

Table 5 shows the percentage distribution of the pattern of the lip prints on the total subjects in fourth quadrant. In males the most common lip print patterns are type I' (87%) followed by type I (86%), type II (73%), type III (59%), type IV (4%) and type V (3%). In females the most common lip print patterns are type I' (83%) followed by type I (63%), type II (65%), type III (24%) and type IV (4%). Type V lip patterns are not seen in females.

Table 5: Lip prints in Fourth Quadrant (LLQ)

Types	Sex	
	Male	**Female**
Type I	67 (86%)	74 (63%)
Type I'	68 (87%)	98 (83%)
Type II	57 (73%)	77 (65%)
Type III	46 (59%)	28 (24%)
Type IV	18 (23%)	5 (4%)
Type V	2 (3%)	0

Table 6 shows the comparison of the results of this study to other studies which showed the predominant pattern of lip prints in all the quadrants among both males and females.

Table 6: Comparison between the present study and other studies regarding Common lip print pattern among males and females

Sl. No.	Previous studies	Order of frequency of lip print patterns
1.	Suzuki and Tsuchihashi (1970)2	III > I > II > IV
2.	Vahanwala (2000)3	I > I' > II > IV > III
3.	Augustine et al (2008)4	III > II > IV > I > I'
4.	Gondivkar et al (2009)5	II > III > I > I' > IV
5.	Gopichand et al (2010)6	III > I > II > IV > I'
6.	Patel et al (2010)7	II > I' > I > IV > III
7.	Nagrane et al (2014)8	II > III > I > I' >IV
8.	Present study (2015)	I' > I > II > III > IV

Discussion

Studies in relation to lip identification and evaluation have been carried out for more than half a century, and its importance has been recognized and accepted worldwide. Research has characterized lip prints in order to ascertain their features and characteristics[6], with lip print types, forensic application of the technique[9], and the method of acquiring lip impressions at the crime scene[7]. Despite of the lip growth with age, the lip print invariably remains the same[7]. A post mortem study revealed that lip prints can be obtained clearly if taken less than 24 hours after death[8].

Unlike fingerprints, unanimity still does not exist between examiners to accept cheiloscopy as a method of human identification[10]. Some researchers are trying to relate characteristic lip patterns with person's gender,

and detected DNA in latent lip prints[11]. Research suggests that there is a conclusive evidence that lip prints are suitable for the successful comparison, analysis and identification of a person to a crime. In fact there have been convictions of perpetrators who were positively identified via the analysis of their known lip prints to those found at the crime scene. There is a need to develop one cohesive cheiloscopy system, practicable in forensic medicine.

In present study common lip print pattern was calculated by considering all the four quadrants among 196 subjects (78 males & 118 females). It was recorded that in males, 85% had type I lip pattern, 90% with type I' pattern, 73% with type II pattern, 51% with type III pattern, 26% with type IV pattern and 2% had type V pattern. In females 73% had type I lip pattern, 84% with type I' lip pattern, 65% with type II pattern, 24% with type III pattern, 9% with type IV pattern. Type V lip pattern was totally absent among female subjects. Present study had shown that type I' lip pattern most commonly seen among all the study subjects.

In the study conducted by Amith HV et al[9] shown that type I' lip patterns were seen in 45% of males followed by type I pattern which is of 16% in males in the first quadrant.

In the study conducted by Augustine et al had shown that most predominant pattern in the entire study population, taking both the upper and lower lips together, was type III which constituted 48.2%, followed in order by type II (18.92%), type IV (17.44%), type I (11.10%), type I' (2.54%) and type V (1.58%). The present study did show 51% of males and 24% of females had type III lip pattern[1].

The present study had showed that type I' (type I variant) lip patterns are most predominant in all the quadrants followed type I patterns, type II, type III and type IV lip patterns in both males and females. These results are in contrast to the previous studies conducted on lip prints by, Kulkarni et al (2013)[12], Ghimire et al (2013)[13], Supraneni et al (2015)[14], Vahanwala et al (2000)[2]. Type I pattern was found to be dominant in females in third and fourth quadrants and type II was dominant in males in third and fourth quadrants as reported by Vahanwala et al[2]. In his study all four quadrants having the same type of patterns was predominantly seen in female subjects. In this study all the four quadrants having same type of patterns and was seen the same both in male and female subjects.

Conclusion

This study concluded that lip prints are a constant anatomical structure and are absolutely unique to an individual and thus are an infallible means of personal identification, if collected and analyzed carefully. Even the prints of the upper lip were different from the lower lip. Such is the uniqueness and it is unchangeable even if taken after some time from the same person. Each lip print pattern never occurred singly but present as a combination of all the 4 patterns.

In the present study, we found that Type I' is common in all the quadrants in both sexes followed by Type I, Type II, Type III and Type IV. The latter two types III and IV are present predominantly in males. Type V lip pattern is present exclusively in males. In finger prints loops are the commonest in both sexes.

With reference to sex, lip prints vary from males and females in the following manner.

1) Grossly, the lips of males are larger in size in length and breadth in comparison to the females.

2) The Vermilion border in males is ill-defined due to the interference of the mustache whereas in females it is well defined with Cupid's bow.

3) Branching and intersection of grooves is more prominent towards the peripheries of all quadrants in both males and females but it is more significant in males.

4) Patterns 3 and 4 are predominant in all the quadrants in males.

5) The least common pattern is Type V which is not found in females but present only in males.

Conflict of Interest – Nil

Source of Funding- Self

Ethical Clearance – Institutional Ethical Committee clearance taken

References

1. Augustine J,Barpande SR, Tupkari JV, Cheiloscopy As An Adjunct To Forensic Identification: A Study Of 600 Individuals. J Forensic Odontostomatol 2008;27:2:44-52.

2. Vahanwal S, Nayak C.D., Pagare S.S. Study of lip prints as aid for sex determination. Medico- legal update, vol. 5, no. 3.
3. Tiwari, S. C. and Chattopadhyay, P. K. (1968): Finger dermatoglyphics of the Tibetans. American Journal of physical Anthropology, 26: Pp. 289-296.
4. Bharathi et al. CHEILOSCOPY Lip Print , and Determination of Sex and Individual. J. Pharm. Sci. & Res. Vol. 7(6), 2015, 330-333.
5. Caldas IM, Magalhaes T, Afonso A. Establishing identity using cheiloscopy and palatoscopy. Forensic SciInt; accepted 21 April 2006. Available from URL: http://www.sciencedirect.com/sdarticle.pdf
6. Endris R, Poetsch-Schneider L. Value of human lip lines and nail striations in identification. Arch Kriminol 1985; **175**(1- 2):13-20.
7. Hashim HA, Sarhan OA, Bukhary MT, Feteih R. Vertical and horizontal linear growth of the maxillary and mandibular lips: a longitudinal study. J Clin Pediatr Dent 1997;21(2):125-29.
8. Utsuno H, Kanoh T, Tadokoro O, Inoue K. Preliminary study of post mortem identification using lip prints. Forensic SciInt 2005; 149 (2-3):129-32.
9. Suzuki, K. and Tsuchihashi, Y. (1970): A new attempt of personal idenfication by means of lip print. Journal of India Dental Association, 42 (1): Pp. 8-9.
10. Vamsi Krishna Reddy. Lip prints: An Overview in Forensic Dentistry. Journal of Adv Dental Research. Volume III; Issue I: Jan 2011.
11. Castello A, Alvarez M, Verdu F. Just Lip prints? No: there could be something else. FASEB J. 2004. Apr; 18(6); 615-6
12. M Kulkarni, Evaluating Uniqueness And Predominent Pattern Of Lip Prints: A Study On Students From Academic Institute, Journal of Forensic Medicine, Science and Law (Jul-Dec 2013)
13. N Ghimire, Lip print pattern: an identification tool (Health Renaissance 2013;11(3):229-233)
14. Surapaneni Ratheesh Kumar Nandan**,** A study on association and correlation of lip and finger print pattern analysis for gender identification, [Downloaded free from http://www.jdrntruhs.org on Wednesday, November 04, 2015, IP: 124.123.20.243]