

Correlation Among Lip Print Pattern, Finger Print Pattern and Abo Blood Group

SRILEKHA N¹, ANURADHA A², VIJAY SRINIVAS G³, SABITHA DEVI R⁴

ABSTRACT

Aim: To study correlation between lip print pattern, finger print pattern and ABO blood group.

Materials and Methods: The study group consisted of 27 males and 27 females who were aged between 20–40 years. Lip prints, finger prints and ABO and Rh blood groups of each individual were recorded. Lip prints were classified, based on Suzuki's and Tsuchihashi's classification and finger prints were classified, based on Michael's and Kucken's classification. The results were statistically analyzed by using Chi-square test.

Results: Complete vertical lip print, loop finger print pattern, O+ blood group were predominant among individual groups. O+ blood group-type I lip print combination, loop finger print pattern-type IV lip print pattern combination, O+ blood group-loop finger print pattern combination and both B+ blood group-loop finger print pattern- type IV lip print pattern combination and O+ blood group-loop finger print pattern-type I lip print pattern were predominant.

Conclusion: Though lip prints, finger prints and blood groups had their own specificities, correlation of the three parameters did not show any significance.

Keywords: Blood groups, Finger print, Lip print, Pattern, Predominant

INTRODUCTION

"Identity" is a set of physical characteristics, functional or psychical-normal or pathological, that define an individual. Individual identification is a crucial and an exigent task in forensic investigation. Although DNA comparisons and finger print analyses are common techniques which are employed to ensure fast and secure identifications, there are certain crime scenarios where other supplemental aids like lip prints, palatal rugae pattern, bite marks, etc become indispensable, since human identification involves a combination of different procedures for individualizing a person or an object. The use of fingerprints and lip prints is of paramount importance, since doing a personal identification by using other means such as DNA analysis is sophisticated and as they are not available in rural and developing countries.

Sulci labiorum are the wrinkles and grooves on the labial mucosa that form a characteristic pattern which is called as lip prints. The study of lip prints is known as cheiloscopy. The wrinkles and grooves which are visible on the lips have been named by Tsuchihashi as 'sulci labiorum rubrorum' [1,2]. The skin on the palmar and plantar surface is wrinkled, with narrow minute ridges which are known as friction ridges. A finger print is an impression of these friction ridges. Study of finger prints is known as dermatoglyphics. Lip prints are unique for an individual, like finger prints [3,4].

The present study aimed to analyze the predominant blood groups, lip and finger print patterns in the study population and to identify whether any correlation among the above parameters could help forensic odontologists in solving crimes.

MATERIALS AND METHODS

The study sample included 54 individuals, of which 27 were males and 27 were females, who were aged between 20 – 40 years. Red coloured lip stick, cellophane tape, white A3 sized paper, blue inked stamp pad, and magnifying lens were the materials which were used.

Exclusion criteria for lip prints: Subjects undergoing orthodontic treatment, congenital lip abnormalities, inflammation of or trauma to lips, hypersensitivity to lipsticks.

Exclusion criteria for finger prints: Subjects with syndromes and permanent scars on their fingers or thumbs, with any hand deformities caused by injuries were excluded.

Blood group of each individual was documented, following which the lip and finger prints were recorded. The glued portion of the cellophane tape was used to obtain the impression of the lip onto which lipstick was applied. This record was immediately transferred onto paper by gently sticking the cellophane tape. For analysis, each lip print was topographically divided into six areas, and only the central portion of the lower lip was considered. For recording finger prints, imprint of the left thumb was taken. These prints were examined by using magnifying glass, classified, and analyzed. Lip prints were classified, based on classification given by Suzuki and Tsuchihashi and finger prints were classified, based on Michael's and Kucken's classification. The results were statistically analyzed by using Chi-square test.

RESULTS

Within individual groups: Complete vertical (46.3%) [Table/Fig-1] loop finger print pattern (53.7%) [Table/Fig-2] and O+ blood group (42.6%) [Table/Fig-3] were the most common parameters which were seen.

Inter-group comparison between two groups: O+ blood group-Type I lip print combination (20.3%), loop finger print pattern- Type IV lip print pattern combination (25.9%), O+ blood group-loop finger print pattern combination were predominant (22.2%). Statistical analysis showed no significance [Table/Fig-4-6].

S.no	Type of lip print Pattern	No. of individuals exhibiting the pattern	Females (n = 27)	Males (n = 27)
1.	Type I – complete vertical	25 (46.3%)	14 (51.9%)	11 (40.7%)
2.	Type I' - incomplete vertical	2 (3.7%)	1 (3.7%)	1 (3.7%)
3.	Type II - branched	2 (3.7%)	1 (3.7%)	1 (3.7%)
4.	Type III - intersecting	4 (7.4%)	2 (7.4%)	2 (7.4%)
5.	Type IV - reticular	18 (33.3%)	7 (25.9%)	11 (40.7%)
6.	Type V - undetermined	3 (5.6%)	2 (7.4%)	1 (3.7%)

[Table/Fig-1]: Distribution of lip print patterns in the study group (n = 54)

S.no	Type of finger print Pattern	No. of individuals exhibiting the pattern	Females (n = 27)	Males (n =27)
1.	Arch	5 (9.3%)	4 (14.8%)	1 (3.7%)
2.	Loop	29 (53.7%)	12 (44.4%)	17 (63.0%)
3.	Whorl	17 (31.5%)	11 (40.7%)	6 (22.2%)
4.	composite	3 (5.6%)	0 (0%)	3 (11.1%)

[Table/Fig-2]: Distribution of finger print patterns in the study group (n = 54)

S.no	Type of blood group	No. of individuals exhibiting the blood group	Females (n = 27)	Males (n =27)
1.	A+	5 (9.3%)	1 (3.7%)	4 (14.8%)
2.	A-	0 (0%)	0 (0%)	0 (0%)
3.	B+	19 (35.2%)	9 (33.3%)	10 (37.0%)
4.	B-	0 (0%)	0 (0%)	0 (0%)
5.	O+	23 (42.6%)	12 (44.4%)	11 (40.7%)
6.	O-	3 (5.6%)	3 (11.1%)	0 (0%)
7.	AB+	4 (7.4%)	2 (7.4%)	2 (7.4%)
8.	AB-	0 (0%)	0 (0%)	0 (0%)

[Table/Fig-3]: Distribution of blood groups in the study group (n = 54)

Blood groups Types	Finger print patterns			
	Arch	Composite	Loop	Whorl
A+	1 (1.85%)	0 (0%)	2 (3.07%)	2 (3.07%)
AB+	0 (0%)	0 (0%)	3 (5.57%)	1 (1.85%)
B+	0 (0%)	1 (1.85%)	11 (20.3%)	7 (13.0%)
O-	1 (1.85%)	0 (0%)	1 (1.85%)	1 (1.85%)
O+	3 (5.57%)	2 (3.07%)	12 (22.2%)	6 (11.1%)

[Table/Fig-4]: Distribution of blood group and finger print pattern combinations in the study group (n = 54)

Blood group Types	Lip print patterns					
	I	I'	II	III	IV	V
A+	1 (1.85%)	0 (0%)	0 (0%)	1(1.85%)	3 (5.57%)	0 (0%)
AB+	3 (5.57%)	0 (0%)	0 (0%)	0(0%)	1 (1.85%)	0 (0%)
B+	8 (14.8%)	0 (0%)	0 (0%)	2 (3.07%)	8 (14.8%)	1 (1.85%)
O-	2 (3.07%)	0 (0%)	0 (0%)	0 (0%)	1(1.85%)	0 (0%)
O+	11 (20.3%)	2 (3.07%)	2 (3.07%)	1 (1.85%)	5 (9.26%)	2 (3.07%)

[Table/Fig-5]: Distribution of blood group and lip print pattern combinations in the study group (n = 54)

Finger print patterns	Lip print patterns					
	I	I'	II	III	IV	V
Arch	3 (5.57%)	0 (0%)	0 (0%)	1(1.85%)	1(1.85%)	0 (0%)
Composite	2 (3.07%)	0 (0%)	1(1.85%)	0 (0%)	0 (0%)	0 (0%)
Loop	10 (18.5%)	2 (3.07%)	0 (0%)	2 (3.07%)	14 (25.9%)	1 (1.85%)
Whorl	10 (18.5%)	0 (0%)	1 (1.85%)	1 (1.85%)	3 (5.57%)	2 (3.07%)

[Table/Fig-6]: Distribution of finger and lip print pattern combinations in the study group (n = 54)

Inter-group comparison between three groups: Both B+ blood group-loop finger print pattern-Type IV lip print pattern combination and O+ blood group-loop finger print pattern-Type I lip print pattern combination (11.1%) were predominant [Table/Fig-7].

Gender: In both males and females, O+ blood group, loop finger print pattern were predominant. Females exhibited Type I lip print pattern, whereas males showed both Type I and IV patterns predominantly [Table/Fig-1-3].

Finger print – lip print pattern combination	Blood group Types				
	A+	B+	AB+	O+	O-
Arch – Type I	0 (0%)	0 (0%)	0 (0%)	2 (3.07%)	1(1.85%)
Arch – Type I'	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Arch – Type II	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Arch – Type III	0 (0%)	0 (0%)	0 (0%)	1(1.85%)	0 (0%)
Arch – Type IV	1 (1.85%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Arch – Type V	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Loop – Type I	0 (0%)	2 (3.07%)	2 (3.07%)	6 (11.1%)	0 (0%)
Loop – Type I'	0 (0%)	0 (0%)	0 (0%)	2 (3.07%)	0 (0%)
Loop – Type II	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Loop – Type III	0 (0%)	2 (3.07%)	0 (0%)	0 (0%)	0 (0%)
Loop – Type IV	2 (3.07%)	6 (11.1%)	1 (1.85%)	4 (7.4%)	1 (1.85%)
Loop – Type V	0 (0%)	1 (1.85%)	0 (0%)	0 (0%)	0 (0%)
Whorl – Type I	1 (1.85%)	5 (9.26%)	1 (1.85%)	2 (3.07%)	1 (1.85%)
Whorl – Type I'	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Whorl – Type II	0 (0%)	0 (0%)	0 (0%)	1 (1.85%)	0 (0%)
Whorl – Type III	1 (1.85%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Whorl – Type IV	1 (1.85%)	2 (3.07%)	0 (0%)	0 (0%)	0 (0%)
Whorl – Type V	0 (0%)	0 (0%)	0 (0%)	2 (3.07%)	0 (0%)
Composite – Type I	0 (0%)	1 (1.85%)	0 (0%)	1 (1.85%)	0 (0%)
Composite – Type I'	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Composite – Type II	0 (0%)	0 (0%)	0 (0%)	1 (1.85%)	0 (0%)
Composite – Type III	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Composite – Type IV	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Composite – Type V	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

[Table/Fig-7]: Distribution of blood groups, finger and lip print pattern combinations in the study group (n = 54)

DISCUSSION

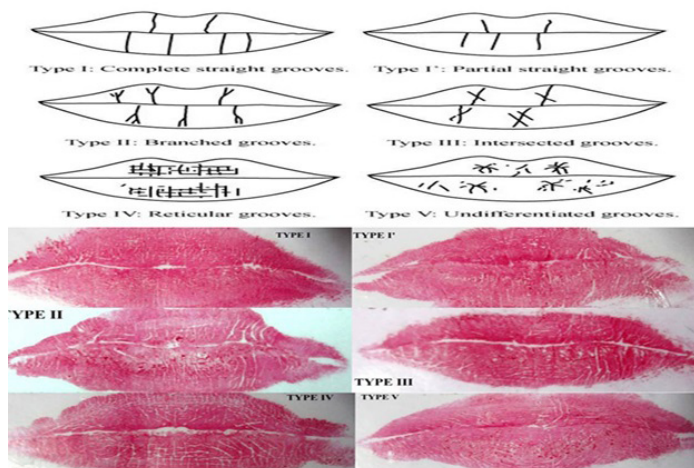
One of the most emerging methods of human identification, which originated from the criminal and forensic practice, is human lips recognition. In 1932, Edmond Locard, one of the criminologists recommended the use of lip prints in personnel identification and criminalization [1,5]. Suzuki and Tsuchihashi, in 1970, devised a new classification of lip grooves which was: Type I - A clear cut groove running vertically across the lip, Type I' - Partial length groove of Type I, Type II - A branched groove, Type III - An intersected groove, Type IV - A reticular pattern and Type V - Undetermined [Table/Fig-8].

Michael and Kucken provided a finger print classification which included: arch, loop, whorl and composite containing two or more forms [Table/Fig-9].

Suzuki and Tsuchihashi divided lip prints into Types I, I', II, III, IV and V, whereas in the study done by Nagasupriya et al., [3], both partial and full vertical lip patterns were included under one category as vertical lip print pattern (Type I) and to prevent overlap, intersected and reticular Type lip prints were unified, because these patterns were almost similar (Type III). The branched lip print constituted the Type II pattern.

Saraswathi et al., [6] found that intersecting pattern of lip print was more common in both males and females. Sharma et al., [7] concluded that Type I and Type I' lip patterns were most commonly seen in females and that Type IV was seen most commonly in males. In contrast to the above studies, our study showed Type I to be predominant in females and Types I and IV to be predominant in males. This may have occurred due to inter-observer mystification in classification of reticular and intersecting types.

In India, O+ is the most common blood type, followed by B+. Our study also showed the same results. But this was in contrast to



[Table/Fig-8]: Suzuki and Tsuchihashi (1970) of lip prints



[Table/Fig-9]: Michael and Kucken classification of finger prints

findings of study done by Piyush A et al., [8] Combination of O+ and loop was more prevalent in our study, followed by combination of B+ and loop, which was reverse of the results which were obtained in studies done by Bhavana et al., [2] and Bharadwaja et al., [9].

Type IV lip pattern -loop type combination was common, whereas in the study done by Nagasupriya et al., [3], Type II lip pattern-loop type combination was more common. The current study showed Type I lip pattern-O+ blood group combination to be predominant, which was not inconsistent with findings of Telagi et al., [10] and Verghese et al., [11].

The review of literature revealed no study which was conducted, which had correlated the lip prints, finger prints and blood groups. Verma et al., [5] correlated lip print patterns with respect to gender, ABO blood groups and Intercommissural Distance (ICD) and found no correlation of lip print pattern with other variables.

Mutalik et al., [12] found no correlation between lip prints, finger prints and palatal rugae patterns. In contrast to these studies, Nagasupriya et al., [3] found a significant correlation only in the combination of branched with loop, arch and whorl in males.

It was observed that both B+ blood group-loop finger print pattern-Type IV lip print pattern and O+ blood group-loop finger print pattern-Type I lip print pattern (6 out of 54 each, 11.1%) were predominant.

CONCLUSION

It is known that individual parameters, i.e., lip patterns, finger print patterns and blood groups play an important role in forensic identification. Correlation of these three parameters in our study did not show any significant association. Hence, these combinations cannot solely be used in individual identification, but rather, they can be used to substantiate facts in crimes where there are utterly few evidences.

REFERENCES

- [1] Adamu LH, Taura MG, Ojo SA, Dahiru A, Sadeeq A, Umar KB. Relationship of thumb prints and lip prints among Nigerians. *IOSR-JDMS*. 2013; 9 (2):12-7.
- [2] Bhavana D, Ruchi J, Prakash T, Kalyan JL. Study of fingerprint patterns in relationship with blood group and gender- a statistical review. *Res J Forensic Sci*. 2013; 1(1): 12-7.
- [3] Nagasupriya A, Dhanapal R, Reena K, Saraswathi TR, Ramachandran CR. Patterns - "A crime solver". *J Forensic Dent Sci*. 2011; 3(1): 3-7.
- [4] Patel S, Paul I, Madhusudan AS, Ramesh G, Sowmya GV. A study of lip prints in relation to gender, family and blood group. *IJOMP*. 2010;1(1):4-7.
- [5] Verma P, Sachdeva SK, Verma KG, Saharan S, Sachdeva K. Correlation of lip prints with gender, ABO blood groups and intercommissural distance. *North Am J Med Sci*. 2013; 5:427-31.
- [6] Saraswathi TR, Mishra G, Ranganathan K. Study of lip prints. *J Forensic Dent Sci*. 2009; 1:28-31.
- [7] Sharma P, Saxena S, Rathod V. Cheiloscropy: The study of lip prints in sex identification. *J Forensic Dent Sci*. 2009;1:24-7.
- [8] Piyush AP, Sangeeta PP, Jigesh SV, Haren OV. Frequency and distribution of blood groups in blood donors in western Ahmadabad - A hospital based study. *NJMR*. 2012; 2(2): 202 - 6.
- [9] Bharadwaja A, Saraswat PK, Aggarwal SK, Banerji P, Bharadwaja S. Pattern of finger-prints in different ABO blood groups. *JIAFM*. 2004; 26(1): 6-9.
- [10] Telagi N, Mujib A, Spoorthi BR, Naik R. Cheiloscropy and its patterns in comparison with ABO blood groups. *J Forensic Dent Sci*. 2011 Jul-Dec; 3(2): 77-80.
- [11] Verghese AJ, Mestri SC. A Study of Efficacy of Lip Prints as an Identification Tool among the People of Karnataka in India. *J Indian Acad Forensic Med*. 2011; 33(3): 200-2.
- [12] Mutalik VS, Menon A, Jayalakshmi N, Kamath A, Raghu AR. Utility of cheiloscropy, rugoscopy, and dactyloscopy for human identification in a defined cohort. *J Forensic Dent Sci*. 2013; 5: 2-6.

PARTICULARS OF CONTRIBUTORS:

1. PG Student, Department of Oral Pathology, St Joseph Dental College and Hospital, Duggirala, Eluru, Andhra Pradesh, India.
2. Professor, Department of Oral Pathology, St Joseph Dental College and Hospital, Duggirala, Eluru, Andhra Pradesh, India.
3. Professor and HOD, Department of Oral Pathology, St Joseph Dental College and Hospital, Duggirala, Eluru, Andhra Pradesh, India.
4. Reader, Department of Oral Pathology, St Joseph Dental College and Hospital, Duggirala, Eluru, Andhra Pradesh, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Anuradha A,
D/ No-10 / 200, Anuradha Ear, Noise and Throat Hospital, Eluru Road, Gudivada, Krishna- 521301, Andhra Pradesh, India.
Phone: 09959166662, 09866867177, 09866049949, E-mail: anuradhaundavalli@yahoo.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Aug 19, 2013**
Date of Peer Review: **Dec 08, 2013**
Date of Acceptance: **Jan 20, 2014**
Date of Publishing: **Mar 15, 2014**