

Cheiloscopy and its patterns in comparison with ABO blood groups

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Abstract

Objective: The aim of this study is to determine the distribution of different lip print patterns among subjects having different ABO and Rh blood groups and to determine the correlation between their characters and blood groups. **Materials and Methods:** The present study was done on 150 individuals who were randomly selected and blood groups of these subjects were analyzed. **Results:** The results revealed no association between distribution of lip print (cheiloscopy) pattern and blood groups. **Conclusion:** Lip print pattern does not show any correlation between blood groups.

Key words: Blood groups, cheiloscopy, types of lip prints

Introduction

Lips are two fleshy folds surrounding the oral orifice. They are lined externally by skin and internally by mucosa. The skin is continuous with the mucosa at the transitional or vermilion border, a reddish zone covered by thin keratinized epithelium. The line of contact between the lips (oral fissure) lies just above the cutting edges of the upper incisor teeth and on each side a labial commissure forms the angle of the mouth, usually near the first premolar tooth. The epithelium of the vermilion area exhibits a less well-developed stratum corneum than the skin.^[1] The lip has many elevations and depressions forming a characteristic pattern called lip print.^[1] The study of lip prints is called cheiloscopy.^[1] It is used for personal identification since lip prints are unique for individuals and do not change during the life of a person. A lip print may be revealed as a stratified surface trace with visible elements of lines, namely the furrows and if the lines are not clear, only the shape of the lips is printed.^[2] It has been verified that they recover

after undergoing alterations like trauma, inflammation and diseases like herpes and that the disposition and form of the furrows does not vary with environmental factors.^[3] A study done by Bharadwaj showed a correlation between fingerprints and blood groups.^[4]

There is no evidence for the study done to correlate lip prints and blood groups in the literature so the present study was done to determine the distribution of different lip print patterns among the subjects having different ABO and Rh blood groups and to determine the correlation between their characters and blood groups. Correlating lip prints with blood groups may be useful in forensic science in accurate identification of an individual than by using lip prints alone.

Aims and objectives

The present study was carried out to determine the distribution of different lip print patterns among subjects having different ABO and Rh blood groups and to determine the correlation between their characters and blood groups.

Materials and Methods

The present study was carried out in the department of Oral Pathology and Microbiology of Bapuji Dental College and Hospital, Davanagere. A sample of 150 individuals was randomly selected for study. Lips free from any pathology, having absolutely normal transition zone between the mucosa and the skin were included in the study. Consent of

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DOI: 10.4103/0975-1475.92150	

all the individuals and ethical clearance from the institution was obtained to carry out the study. All the individuals lip prints and blood groups were studied.

The lips of the subject were first cleaned thoroughly. The lips were then outlined using a sharp lip liner pencil. No. 15 “High Wattage” Lipstick was applied uniformly to the lips using lipstick applicator brush starting at the midline and moving laterally as shown in [Figure 1]. The lipstick was allowed to dry for about 2 min after which lip prints were taken using No. 1 Whatman’s filter paper as shown in [Figure 2].

Each lip was divided into three quadrants starting from right upper quadrant to right lower quadrant (Q1-Q6) as shown in [Figure 3]. The type of lip print was assessed in all the six quadrants and the type which was repeated the maximum number of times was considered as described by Rajendran and Shivpathasundharam.^[5]

Blood groups of the subjects were analyzed by placing a drop of blood on the slide and treated with anti-A and anti-B sera. Positive agglutination of the blood on treating with anti-A is considered as blood group A, positive reaction with anti-B is considered as blood group B, if no agglutination is produced then the blood group is O and if agglutination is seen with both antisera then blood group AB is considered. Similarly, positive agglutination reaction with Rh antigen is considered Rh + or otherwise as Rh-. The results obtained were analyzed by using Pearson’s Chi-square test [Table 1].

Results

Lip prints

Branched type of lip prints were the most common pattern which accounts for about 40.7% followed by intersecting (25.3%), reticular (14.7%), vertical (12.7%) and undermined type [Graph 1].

Blood groups

Among the total of 150 individuals 73 (48.7%) belonged to blood group “O”, followed by 24% of “B Positive” about 23.3% of “A Positive,” and “A Negative”, B Negative” and “AB Negative” about 1.3% respectively [Graph 2].

Correlation of lip prints with blood groups

Frequency of vertical type of lip prints was 17.1% among “A Positive” blood group, 12.7% among “O Positive” and 11.1% among “B Positive” blood groups. Distribution of branched type lip prints showed 100% with “AB Negative”, 50% with “A Negative and B Negative”, 47% with “B Positive” and 34.3% with “A Positive”. Intersecting type showed 25.7% with “A

Positive”, 50.0% with “A Negative”, 25% with “B Positive” and 26% with “O Positive” group. Distribution of reticular type lip prints showed 16.4% with “O Positive”, 14.3% with



Figure 1: Method of application of lipstick



Figure 2: Method of obtaining lip print by using No. 1 Whatman’s filter paper



Figure 3: Division of lip print into six quadrants starting from upper right (Q1) to lower right (Q6), (Rt – right, Lt: left, U: upper, L: lower, Q1-Q6 – Quadrant 1 – Quadrant 6)

Table 1: Correlation of lip prints and blood groups

Pearson’s Chi-square	df	P value
4.80	12	0.96

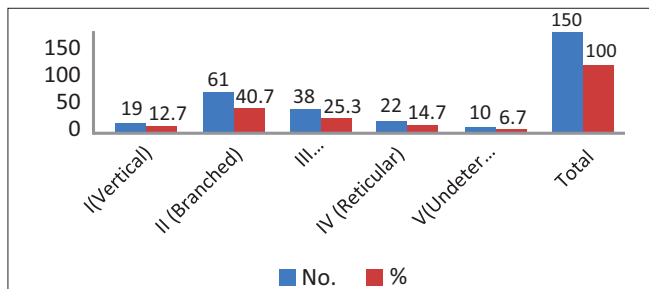
“A Positive” and 13.9% with “B Positive” blood group and undetermined type showed 50% with “B Negative”, 8.6% with “A Positive”, 6.8% with “O Positive” and 2.8% with “B Positive” blood group [Table 2].

Discussion

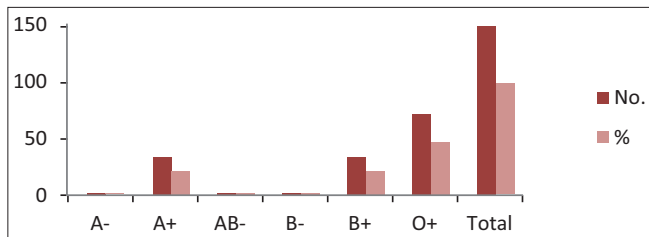
One of the most interesting emerging methods of human identification, which originates from the criminal and forensic practice, is human lips’ recognition.^[6]

A lip print may be revealed as a stratified surface trace with visible elements of lines, namely the furrows. Lip prints are unique and do not change during the life of a person.^[2]

Fischer, in 1902, was the first anthropologist to describe the furrows on the red part of the human lips. However,



Graph 1: Distribution of lip prints



Graph 2: Distribution of blood groups

Table 2: Distribution of lip prints with blood groups

LIP PRINT	Blood group						Total
	A+	A-	AB-	B+	B-	O+	
I (Vertical)	No. 6	0	0	4	0	9	19
	% 17.1%			11.1%		12.3%	12.7%
II (Branched)	No. 12	1	2	17	1	28	61
	% 34.3%	50.0%	100.0%	47.2%	50.0%	38.4%	40.7%
III (Intersecting)	No. 9	1	0	9	0	19	38
	% 25.7%	50.0%		25.0%		26.0%	25.3%
IV (Reticular)	No. 5	0	0	5	0	12	22
	% 14.3%			13.9%		16.4%	14.7%
V (Undetermined)	No. 3	0	0	1	1	5	10
	% 8.6%			2.8%	50.0%	6.8%	6.7%
Total	No. 35	2	2	36	2	73	150
	% 100%	100%	100%	100%	100%	100%	100%

it was only in 1932 that Edmond Locard, one of France’s greatest criminologists, recommended the use of lip prints in personal identification and criminalization.^[2] In 1950, Snyder reported in his book on homicide investigation that the characteristics of the lips formed by lip grooves are as individually distinctive as the ridge characteristics of fingerprints.^[2] Suzuki, in 1967, made detailed investigations of the measurement of the lips, the use and color of rouge and the method for its extraction to obtain useful data for practical forensic applications.^[2] Later, Suzuki and Tsuchihashi, named the grooves on the labiorum rubrorum as sulci labiorum and the lip prints consisting of these grooves as “figura linearum labiorum rubrorum”. Cottone, in 1982, reported in his book *Outline of Forensic Dentistry*, that cheiloscopy is one of the special techniques used for personal identification.

Classification of lip prints

In 1967, Santos classified lip grooves into four types as:^[2]

1. Straight Line
2. Curved Line
3. Angled Line
4. Sine-Shaped Line

Suzuki and Tsuchihashi in 1970, devised a classification where they divided lip grooves into:^[5]

1. Type I – A clear-cut groove running vertically across the lip
2. Type I’ – Partial-length groove of Type I
3. Type II – A branched groove
4. Type III – An intersected groove
5. Type IV – A reticular pattern
6. Type V – Other patterns

Blood groups

O-A-B blood types

Blood of individuals is normally classified into four major blood types—O-A-B-AB, depending on the presence or absence of the A and B agglutinogens. When neither A nor B agglutinin is present, the blood is Type O. When only type A agglutinin is present, the blood is Type A. When only Type B agglutinin is present, the blood is Type B. When both A and B agglutinogens are present, the blood is Type AB.^[7]

Two genes, one on each of the two paired chromosomes, determine the O-A-B blood type. These genes can be any one of three types but only one type on each of the two chromosomes: Type O, Type A, or Type B. The Type O gene is either functionless or almost functionless, so that it causes no significant Type O agglutinin on the cells. Conversely, the Type A and Type B genes do cause strong agglutinogens on the cells.

Rh blood types

There are six common types of Rh antigens, each of

which is called an *Rh factor*. These types are designated C, D, E, c, d, and e. A person who has a C antigen does not have the c antigen, but the person missing the C antigen always has the c antigen. The same is true for the D-d and E-e antigens. Also, because of the manner of inheritance of these factors, each person has one of each of the three pairs of antigens. The Type D antigen is widely prevalent in the population and considerably more antigenic than the other Rh antigens. Anyone who has this type of antigen is said to be *Rh-positive*, whereas a person who does not have Type D antigen is said to be *Rh-negative*. However, it must be noted that even in Rh-negative people, some of the other Rh antigens can still cause transfusion reactions, although the reactions are usually much milder.

Frequency of vertical type of lip prints was more among the "A Positive" group. Distribution of branched type lip prints was more for "AB Negative". Intersecting type showed increased expression among individuals with "A Positive" blood group. Distribution of reticular type lip prints was more in "O Positive" blood group and undetermined type showed increased expression among individuals with "B Negative" blood group.

Conclusion

The present study reveals that the general distribution pattern for lip prints was in the order of branched

type followed by intersecting, reticular, vertical and undetermined type and distribution pattern for blood group was "O" group followed by "B Positive", "A Positive", and "A Negative", "B Negative" and "AB Negative" respectively and lip print (cheiloscopy) pattern does not show any correlation between blood groups.

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How to cite this article: Telagi N, Mujib A, Spoorthi BR, Naik R. Cheiloscopy and its patterns in comparison with ABO blood groups. *J Forensic Dent Sci* 2011;3:77-80.

Source of Support: Nil, **Conflict of Interest:** None declared

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