

Assessment of Correlation of Lip Print with Gender and Blood Group among Dental Students of Visnagar, Gujarat, India

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ABSTRACT

Background: Human identification is necessary for personal, social, and legal reasons. Some methods of personal identification include anthropometry, dactyloscopy, DNA test, fingerprinting, sex determination, estimation of age, measurement of height, post-mortem reports, blood groups, and lip print. The aim of the present study was to assess the correlation of lip print pattern with gender and ABO blood group.

Materials and Methods: A study was conducted among 233 undergraduate dental students of Visnagar of Gujarat state, India during the month of May, 2014. Lipstick was used to record lip print of each subject. To identify the blood group of study subjects, a drop blood of each subject was placed on a slide and mixed with anti-A, anti-B, and anti-Rh sera.

Results: Type II (A branched groove) pattern was to be found more in both male (44.2%) and female (31.5%). Type II (A branched groove) pattern was to be found more among study subjects with blood Group A (29.4%), B (37.3%), and O (37.1%) blood group. No correlation was found between lip print and blood group.

Conclusion: The present study did not show any statistical correlation of lip print pattern with gender and ABO blood groups.

Key words: ABO blood group system, Gender identity, Informed consent, Lip, Rh-Hr blood-group system

INTRODUCTION

Human identification is the recognition of an individual based on some physical characteristics of the individual. It involves some normal or abnormal characteristics that define an individual. Human identification is necessary in some conditions such as social identification, criminal identification, and during natural disaster.¹ Different methods such as lip print, DNA test, fingerprint, sex determination, measurement of weight, measurement of height, post-mortem reports, and blood groups are used to identify individual. Lip prints can be used as one of the reliable method for personal identification.²⁻⁴

The lip has many elevations and depressions. The study of lip prints is called cheiloscopy.⁵ Tsuchihashi and Suzuki established that the lip print is always unique for every

individual.^{2,6} In 1981, Cottone reported that cheiloscopy is used as a special technique for the purpose of personal identification.⁷

The blood group system was discovered in 1901 by Karl Landsteiner. Totally, 19 major groups have been identified in humans. Among these only "ABO" and "Rhesus" groups are used in the majority of time. The presence of antigen in plasma, "ABO" system is classified as A, B, AB, and O blood groups. The presence of "D" antigen in plasma, "Rhesus" system is classified into "Rh +ve" and "Rh -ve."⁸

No correlation of lip print with gender and blood group is the null hypothesis and the presence of correlation of lip print with gender and blood group is the alternative hypothesis for the present study. Though extensive research work has been carried out regarding cheiloscopy and blood group system

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independently; combined study correlating the two entities are very few. Hence, to bring forth, further correlation between cheiloscopy and blood group system, the present study has been carried out to assess correlation of lip print pattern with gender and ABO blood group among dental students of Visnagar city of Gujarat, India.

MATERIALS AND METHODS

A study was conducted among 233 undergraduate dental students of Visnagar city of Gujarat state during the month of May, 2014. Prior to the study, ethical clearance was obtained from the ethical committee. Written informed consent was obtained from the study subjects. A single calibrated trained interviewer described the purpose and process of the study to the participants and recorded lip print. The examination was done on a simple chair and in daylight. Before the main study, the pilot study was done on the 20% participants.

Inclusion Criteria

1. Subjects willing to participate in the study,
2. Subjects were ready to provide informed consent,
3. Subjects without any inflammatory disease, trauma, malformation, deformity or scars on the lip.

Exclusion Criteria

1. The subjects undergoing orthodontic treatment, the presence of congenital lip abnormalities, inflammation or trauma of lips, hypersensitivity to lipsticks were excluded from the study.

Study Materials

1. Commercially available lipstick and lip brushes,
2. Cellophane tape that was transparent and glued on one side,
3. White bond paper,
4. Magnifying lens,
5. Tissue paper,
6. Anti-A sera, anti-B sera, anti-Rh sera, and slides for ABO blood group testing.

Techniques

The lips of the subjects were cleaned, and a pink lipstick was applied uniformly (Figure 1). To maintain hygiene separate lip print was used for each subject. After that, the glued portion of the transparent cellophane tape was placed on the lip in the normal rest position (Figure 2). After that, removed cellophane strip was stuck on the white bond paper, and serial number was written on paper for a permanent record. The subject was provided with tissue paper to clean the lips. Care was taken to avoid any wrinkles and air bubbles. A magnifying lens was used to analyze lip print during the same day of lip print impression. The patterns were studied along the entire length and breadth of an impression. Suzuki and Tsuchihashi classification were used to classify lip prints^{2,6} (Figure 3).

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 – Undetermined.

A drop of blood of each study subject was mixed with anti-A, anti-B, and anti-Rh sera on the slide. A positive reaction with anti-A, anti-B, both anti-A and anti-B are considered as



Figure 1: Application of lipstick



Figure 2: Transparent cellophane tape placement



Figure 3: Suzuki and Tsuchihashi classification for lip prints

blood group A, B, AB, respectively. The absence of reaction with both anti-A and anti-B is considered as blood group O. Similarly, positive agglutination reaction with Rh antigen is considered as Rh +ve and the absence of reaction with Rh antigen is considered as Rh -ve (Figure 4).

Statistical Analysis

The collected data were tabulated using Excel 2007 and analysis performed using Statistical Package for the Social Sciences 16.0 version developed by IBM Corporation, USA. Pearson Chi-square test and contingency coefficient test were used. The level of significance was set at $P \leq 0.05$.

RESULTS

Table 1 shows the distribution of study subjects based on lip print pattern and gender. Type II (A branched groove) pattern (34.3%) was the most common while Type III (An intersected groove) pattern (5.2%) was the least common among study subjects. Type II (A branched groove) pattern was to be found more in both male (44.2%) and female (31.5%). There was not a significant association between lip print pattern and gender ($P = 0.256$).

Table 2 shows the distribution of study subjects based on lip print pattern and ABO blood group. Type II (A branched groove) pattern was to be found more among study subjects with blood group A (29.4%), B (37.3%), and O (37.1%) blood group while Type I (clear cut groove running vertically across the lip) pattern was to be found more among subjects with AB (25.9%) blood group. There was not a significant association between lip print pattern and ABO blood group ($P = 0.842$).



Figure 4: Blood group testing

Table 1: Distribution of study subjects based on lip print pattern and gender

Lip print	Male (%)	Female (%)	Total (%)
Type I	9 (17.3)	28 (15.5)	37 (15.9)
Type I'	5 (9.6)	43 (23.8)	48 (20.6)
Type II	23 (44.2)	57 (31.5)	80 (34.3)
Type III	2 (3.8)	10 (5.5)	12 (5.2)
Type IV	7 (13.5)	19 (10.5)	26 (11.2)
Type V	6 (11.5)	24 (13.3)	30 (12.9)
Total	100 (100.0)	100 (100.0)	233 (100.0)

$P=0.256$ non-significant, Correlation value=0.165

Table 3 shows the distribution of study subjects based on lip print pattern and Rh factors. Type II (A branched groove) pattern was to be found more common among study subjects with "+ve" (35.3%) blood group while Type I (clear cut groove running vertically across the lip) pattern was to be found more common among study subjects with "-ve" (33.3%) blood group. There was not a significant association between lip print pattern and Rh factors ($P = 0.312$).

Table 4 shows the distribution of study subjects based on lip print pattern and ABO blood group with Rh factor. Type II (A branched groove) pattern was to be found more common among study subjects with A +ve (29.0%), B +ve (37.0%), O +ve (39.5%) blood group. Type I' (Partial length groove of Type I) pattern was to be found more common among study subjects with AB +ve (27.3%) blood group while Type I (clear cut groove running vertically across the lip) pattern was to be found more common among study subjects with AB -ve (80.0%) blood group. There was not a significant association between lip print pattern and ABO blood group with Rh factor ($P = 0.507$).

DISCUSSION

The present study was conducted to assess the relationship of lip print with gender and ABO blood group among dental students of Visnagar city of Gujarat, India. It is a method of identification of a person based on the arrangement of lines on the lips. In the present study, Type II pattern was the most predominant among both male and female subjects. The result was similar to study done by Gondivkar *et al.*⁹ and contradictory from the study was done by Multani *et al.*¹⁰ (Type III was a predominant pattern among male and Type I among female). Patel *et al.* stated that Type I was the most prominent pattern

Table 2: Distribution of study subjects based on lip print pattern and ABO blood group

Lip print	A (%)	B (%)	AB (%)	O (%)	Total (%)
Type I	3 (8.8)	11 (13.3)	7 (25.9)	16 (18.0)	37 (15.9)
Type I'	7 (20.6)	20 (24.1)	6 (22.2)	15 (16.9)	48 (20.6)
Type II	10 (29.4)	31 (37.3)	6 (22.2)	33 (37.1)	80 (34.3)
Type III	2 (5.9)	4 (4.8)	2 (7.4)	4 (4.5)	12 (5.2)
Type IV	5 (14.7)	7 (8.4)	3 (11.1)	11 (12.4)	26 (11.2)
Type V	7 (20.6)	10 (12.0)	3 (11.1)	10 (11.2)	30 (12.9)
Total	34 (100.0)	83 (100.0)	27 (100.0)	89 (100.0)	233 (100.0)

$P=0.842$ non-significant, Correlation value=0.199

Table 3: Distribution of study subjects based on lip print pattern and Rh factors

Lip print	+ve (%)	-ve (%)	Total (%)
Type I	30 (14.4)	6 (33.3)	37 (15.9)
Type I'	45 (20.9)	3 (16.7)	48 (20.6)
Type II	76 (35.3)	4 (22.2)	80 (34.3)
Type III	12 (5.6)	0 (0.0)	12 (5.2)
Type IV	24 (11.2)	2 (11.1)	26 (11.2)
Type V	27 (12.6)	3 (16.7)	30 (12.9)
Total	215 (100.0)	18 (100.0)	233 (100.0)

$P=0.312$ non-significant, Correlation value=0.185

Table 4: Distribution of study subjects based on lip print pattern and ABO blood group with Rh factor

Thumb print	A+VE (%)	A-VE (%)	B+VE (%)	B-VE (%)	AB+VE (%)	AB-VE (%)	O+VE (%)	O-VE (%)	Total (%)
Type I	3 (9.7)	0 (0.0)	11 (13.6)	0 (0.0)	3 (13.6)	4 (80.0)	14 (17.3)	2 (25.0)	37 (15.9)
Type I'	6 (19.4)	1 (33.3)	20 (24.7)	0 (0.0)	6 (27.3)	0 (0.0)	13 (16.0)	2 (25.0)	48 (20.6)
Type II	9 (29.0)	1 (33.3)	30 (37.0)	1 (50.0)	5 (22.7)	1 (20.0)	32 (39.5)	1 (12.5)	80 (34.3)
Type III	2 (6.5)	0 (0.0)	4 (4.9)	0 (0.0)	2 (9.1)	0 (0.0)	4 (4.9)	0 (0.0)	12 (5.2)
Type IV	5 (16.1)	0 (0.0)	6 (7.4)	1 (50.0)	3 (13.6)	0 (0.0)	10 (12.3)	1 (12.5)	26 (11.2)
Type V	6 (19.4)	1 (33.3)	10 (12.3)	0 (0.0)	3 (13.6)	0 (0.0)	8 (9.9)	2 (25.0)	30 (12.9)
Total	31 (100)	3 (100)	81 (100)	2 (100)	22 (100)	5 (100)	81 (100)	8 (100)	233 (100)

$P=0.507$ non-significant, Correlation value= -0.358

among male subjects and Type II among female subjects.¹¹ Sharma *et al.* concluded that Type I and Type I' lip patterns were most commonly seen in female and that Type IV was seen most commonly in males.¹² A study was done by Srilekha *et al.* showed that Type I was predominant among females and Types I and IV among predominant in males. This may have occurred due to inter- observer mystification in the classification of reticular and intersecting types. Various studies have shown that the lip print patterns formed revealed a population wise dominance that is a particular population is showing a predominance of a particular lip print type. This is potentially useful tool for identification.^{13,14}

Tsuchihashi found that Type III was predominant among the Japanese subjects.² In India, Vahanwalla and Parekh studied lip prints from 50 male and 50 female subjects in Mumbai. They found that Type I was predominant in the lower lip among the females and that the male subjects tended to have different types in all quadrants of the lips.¹⁵

Sivapathasundharam *et al.* studied the lip prints of 200 Indo-Dravidian persons. They stated that Type III was a predominant pattern.¹⁶ Multani *et al.* stated that Type I pattern was the predominant lip print pattern.¹⁰ Results were contradictory from our study, in which Type II was a predominant pattern.

In our study, only 13.3% female subjects had Type V pattern. A study done in Nepal stated that Type V pattern was not seen among any females.¹⁷ This was in contrast to study done on Goan population, where Type V pattern was a most predominant pattern.¹⁸ In our study, no statistically observed difference between males and females in individual lip print types ($P = 0.256$) similar to study done by Verma *et al.*¹⁴

In India, O +ve is the most common blood type, followed by B +ve¹³ but B +ve blood group was predominant in the study done in Rajasthan, India.¹⁴ O +ve was the predominant blood group in the study done by Dennis in Abaraka.¹⁹ In our study, both O+ve, as well as B +ve were the predominant blood groups, which were similar to the study done by Raloti in Gujarat.²⁰

In our study, it was noted that in blood group A +ve, Type II was the most prominent lip pattern. In blood group B +ve, it was noted that Type I was the most prominent lip pattern. In blood group O +ve, it was noted that Type II was the most prominent lip pattern. Similar result was observed in the study done in Rajasthan, India.¹¹

The results revealed no significant correlation between the distribution of lip print patterns and ABO blood group ($P = 0.842$). The results matched with previous studies done

by Verma *et al.*¹⁴ in Rajasthan, Telagi²¹ in South India, and Sandhu²² in Punjab.

CONCLUSION

The present study concluded that the Type II (branched groove) was the most predominant lip print pattern. Both the O +ve and B +ve blood group were equally predominant among subjects. The present study did not show any statistical correlation of lip print pattern with gender and ABO blood groups.

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