ORIGINAL RESEARCH

Blood group and Cheiloscopic Pattern: An Aid in Forensic Investigation?

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Abstract

Introduction: In criminal investigations and court cases, as well as in civil identification and civil litigation, forensic dentistry is essential. The analysis of lip prints is among the least invasive and cost effective way of human identification. Lip prints like blood groups can add as an adjunct in the investigations where in situations of mass disasters.The aim of the study was to assess and corelate lip pattern and blood groups in 100 study participants.

Materials and Methods: A total of 100 participants, 50 male and 50 female were included in the study. The method followed was according to Costa and Caldas Technique, and the classification method followed was according to Suzuki and Tsuchihashi Y et al.

Result: Type 1 and Type 4 showed correlation with O positive blood group. Type III was seen with a predilection with B positive blood group. It was further observed that type 1 lip print type was seen more in males when compared to females. Females showed both Type 1 and Type 4 lip print.

Discussion: The present study showed a trail of association with Type 1 and 4 in O positive blood group subjects. The Type 1 was seen in males and females, but females were more associated with Type 4 lip print. This study was in accordance with the results found by Kersarwani et al. in 2021.

Conclusion: Though the present study showed no statistical significance it can be carried out with a larger sample size.

Keywords: Blood grouping, Lip prints, Forensic, Cheiloscopy.

Introduction

Cheiloscopy is the study of furrows and grooves present on the red part, or the vermilion border of the human lips. The type of groves is unique for an individual and can be used for person identification. Forensic Science has been described as "an application of scientific methods and techniques to matters under investigation by a court of law." In forensic sciences and investigation, hair, bodily fluids, DNA testing, and blood analysis are among the characteristics that can be employed.

The principle aim in this study was to assess and corelate the lip pattern and blood groups in 100 study participants

Materials and Methods

A cross-sectional study with 100 participants, 50 of whom were female and 50 of whom were male, ages 18 to 25, was carried out. The study was conducted among 100 dental college students after obtaining Informed consent from the participants to determine if there was in correlation between blood groups and the various lip print types. Tsuchihashi Y categorization was utilized for the analysis and interpretation of these lip patterns.[4,5] Later required associated matching with the blood groups was done to determine the predominant lip print type with the ABO and Rh blood grouping system. The method applied was according to Costa and Caldas Technique[3]. The Surface of lips were cleaned, and Lipstick wastaken on the applicator. The lipstick was applied such that it is uniformly smeared on both the lips. Cellophane tape is uniformly and gently applied to lips in rest position. The cellophane tape is removed in one swing and stuck to bond paper.

Exclusion and Inclusion Criteria: Study participants with lips free from any evidence of active or passive lip lesions like viral infections, any mucocutaneous lesions of the lips were excluded from the study. The exclusion criteria for lip prints were subjects undergoing orthodontic treatment,

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congenital lip abnormalities, inflammation or trauma to lips and/or hypersensitivity to lipsticks.

Results

The study was done using statistical package (SPSS), IBM statistics for windows, Version 22.0, Armonk, NY: IBM. "P" value is the probability role at 0.05 level of significance for the corresponding degree of freedom. P<0.05 is significant, P>0.05 is not significant.

The following interpretations were done based on the results obtained. It was observed that Type 1 and 4 showed correlation with O positive blood group.Type 3 was seen with a predilection to B positive blood group. Further, Males had more of Type 1 lip print type. Females showed both Type 1 and Type 4 lip print. (Table 1 and 2)

Discussion

Cheiloscopy is a forensic method that identifies individuals based on their specific lip imprints. A well-known lipprint (LP) pattern appears as early as the sixth week of pregnancy. Fisher documented the presence of grooves and furrows on the red region of the human lip for the first time in 1902[7]. The LP pattern was initially advocated by criminologist Edmond Locard (1932), and was later described by Dr.Martins Santos in 1967 based on the pattern of lip grooves. He divided it into four types: (1) straight lines, (2) curved lines, (3) angled lines, and (4) sinuose curves. Suzuki, a Japanese doctor, provided another generally recognised categorization of LP in 1970, categorising it into five kinds[1]. The current study included 100 participants (50 males and 50 females) to assess the connection of LP with gender and ABO blood group. It was an attempt to determine whether the LP and blood group had the capacity to determine an individual's sex and identity.

The results corroborated those of Multani et al. and Gondikar et al., who discovered that Type III was the most common pattern in males and Type II in both males and females. However, the findings were similar to those of Patel et al., who found that Type I was the most common pattern among male participants while Type II was the most common among female participants.[8,9]

Sharma et al. determined in their study that Type I and Type I' lip patterns were more common in females, but Type IV was more common in males[6]. In their study, Srilekha et al. discovered that Type I lip pattern was more common in females while Types I and IV lip pattern was more common in men. This discrepancy might be attributed to inter-observer variability in reticular and intersecting type categorization. Earlier research has found that the LP pattern forms exhibited a population-wise dominance, which is a distinct lip pattern predominance in a given group of people.

Table 1: Interpretation of lip prints based on blood groups

Type of lip prints	Blood groups						Chi square value	p-value
	A+	B+	AB+	AB-	O+	O-		
Type 1	5 (15.2%)	10 (30.3%)	1 (3%)	0 (0%)	16 (48.5%)	1 (3%)	14.550	0.951
Type 1′	2 (22.2%)	3 (33.3%)	0 (0%)	0 (0%)	4 (44.4%)	0 (0%)		
Type 2	4 (26.7%)	4 (26.7%)	1 (6.7%)	1 (6.7%)	5 (33.3%)	0 (0%)		
Type 3	3 (18.8%)	6 (37.5%)	0 (0%)	0 (0%)	6 (37.5%)	1 (6.2%)		
Type 4	3 (15%)	4 (20%)	0 (0%)	1 (5%)	11 (55%)	1 (5%)		
Type 5	2 (28.6%)	2 (28.6%)	1 (14.3%)	0 (0%)	2 (28.6%)	0 (0%)		

Table 2 : Interpretation of lip prints in males and females

Gender	Type of lip prints						Chi square value	p-value
	Type 1	Type 1′	Type 2	Type 3	Type 4	Type 5		
Males	20 (40%)	3 (6%)	10 (20%)	6 (12%)	7 (14%)	4 (8%)	7.094	0.214
Females	13 (26%)	6 (12%)	5 (10%)	10 (20%)	13 (26%)	3 (6%)		

Tsuchihashi discovered that Type III LP was more common in Japanese individuals. Vahanwalla and Parekh tested 50 male and 50 female patients for LPs and discovered that Type I was more typically seen on the lower lip in females, whereas male subjects had a variety of kinds in all quadrants of the lips.In their research of 200 Indo-Dravidian people, Sivapathasundharam et al. identified Type III to be the leading pattern, whilst Multani et al. discovered Type I to be the prevalent LP pattern. Type I and Type V were the least often seen LP kinds in the whole population in the current investigation.In their study, Srilekha et al. discovered that O positive was the most prevalent blood group type, followed by B positive, however Verma et al. observed that B positive blood group was the most common[4,2,8].

In our investigation, O positive and B positive were the most common blood types, which was consistent with a study done by Raloti et al. In our investigation, those with the O +ve blood type had the most pronounced lip pattern, Type I and IV. The B+ve blood group was showed lip prints, type III. The findings demonstrated a substantial relationship between LP patterns and ABO blood group, as well as a sex-based distribution of LPs and ABO blood group.

There hasn't been much research comparing blood groups and LPs, however Suzuki and Tsuchihashi claimed that there is some association between heredity and LP and that LP types are inherited similarly to blood group heredity.

Conclusion

The present study showed a trail of association with Type 1 and 4 in O-positive blood group subjects. Type 1 was seen in males and females, but females were associated more with Type 4 lip print. This study was in accordance with the results found by Kesarwani et al, 2021.

Though the present study showed no statistical significance, it can be carried out with a larger sample size.

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