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ORIGINAL ARTICLE

Cheiloscopy: A Study of Most Common Morphological Patterns of Lip Prints Among Male Students and Employees of Peshawar Medical College

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ABSTRACT

Objective: To determine the frequency of most common morphological patterns of lip prints among male students and employees of Peshawar Medical College.

Design: It was a cross-sectional study.

Study Settings: This study was conducted at Forensic Medicine Laboratory of Peshawar Medical College from November 2021 to April 2022.

Material and Methods: A total of 201 male voluntary participants both students and employees were included in the study. Lip prints were be obtained from them using lipstick and cellophane tape, and studied in the presence of lip print expert. The lip print patterns were classified and frequencies determined.

Results: Overall pattern, type V (26.62%) and type III (19.58%) were the most common ones. There was no significant difference between the ethnicity.

Conclusion: It might be said that lip prints are distinctive, and that using them to identify people. The results showed that print of any two lips were not matched exactly. The patterns did not reveal any significant variability with regards to gender or ethnicity. Thus, trivializing the concept that lip prints can be used as a good indicator for gender determination.

Keywords: Lip Prints, Classification, Pattern Types, Cheiloscopy

INTRODUCTION

A person's uniqueness is based on his or her personal identity. Because of the wide variety of traits that make up each and every human being, it is critical to be able to recognise them.[1,2] Dactylography, rugoscopy, DNA fingerprinting, and cheiloscopy are only few of the techniques used in forensic medicine to identify individuals.[3] Forensic science uses cheiloscopy to investigate and examine the patterns of the lip prints in order to identify a person's identity. It is one of the most important ways to identify a specific individual.[4] It can be used in plane crash and burn scenarios where other regularly used approaches fail to acquire data.[5] Lip prints on cigarette butts, glasses, clothing, cups, windows, and doors are also gathered by crime scene investigators as a trace evidence.[6,7]

Lip pattern printing is regarded one of the most reliable, simple, and time-saving ways of personal identification since lips naturally feature unique lines and grooves that vary from person to person and population to population.[8] Lip print patterns can be influenced by a variety of factors, some of which are listed below. You should take lip prints within 24 hours after death as an example. The opening and closing of the mouth also has an effect on the pattern. [9,10,]

For this reason, scientists have examined a wide range of lip print patterns. In the end, various classifications were created, including Santos, Suzuki and Tsuchihashi, Renaud's and Kapserzak. Suzuki & Tsuchihashi's classification, on the other hand, is the most common. For the first time, R. Fischer described ridges on the red area of the lips. It was Le Moyne Snyder, not Edmond Locard, who first proposed using this area of research as a means of constructing one's own unique sense of self.[11,12] Since then, it's been the subject of substantial investigation as a means of constructing one's own particular identity. However, cheiloscopy studies have been conducted in Pakistan only sporadically, and no investigations have been conducted in Peshawar. So we want to conduct this study to see the frequency of most common morphological patterns of lip prints among male students and employees of Peshawar Medical College.

MATERIAL AND METHODS

This cross sectional study was conducted at Forensic Medicine Laboratory of Peshawar Medical College from November 2021 to April 2022. Sampling was done from students and employees of Peshawar medical college by convenient method. Sample size of 201 (183 students and 18 employees) was calculated using "anticipated proportion" form a previous study done in Pakistan which placed the Type III lip pattern at a percentage of 44.5%.[13] Individuals having scars or inflammation involving area of lip, deformities of lip like cleft lip/palate, individuals having known allergy to lip stick products were not included in the study.

The equipment used for the lip print collection included: Dark pink lip stick, cellophane tape, paper, table lamp, and hand held magnifying glass. Red lipstick was applied consistently to the lips after the participants had cleaned and dried their lips for one minute. To ensure a reliable record, the cellophane strip was removed and laid over white A4 bond paper. Using a magnifying glass, Suzuki and Tsuchihashi classified the lip prints, which were then examined further.[14] Suzuki and Tsuchihashi's classification of lip prints, Grooves with Type I' vertical grooves Type I and Type II Branched Grooves partial length over the lip grooves. Type III is a pattern of intersecting grooves, Type IV is a pattern of reticular grooves, and Type V is another design. As a result, two perpendicular lines were used to partition the lip prints into four equal quadrants: (shown in Figure 1). Data analysis was be done using SPSS v.16. The age was presented in form of mean ±SD. While qualitative variables like, gender, pattern of lip print was presented in the form of frequencies and percentages. The frequency of different lip print patterns were determined. The frequency of pattern of lip print were also be compared among the two genders. To distinguish between the gender differences in lip print patterns, the Chi square test was performed. A 0.05 p-value was regarded as significant.

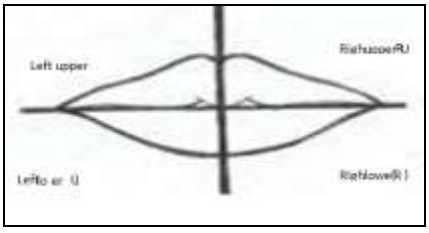

Figure 1: illustrates how Lip prints were divided into four quadrants for analysis

RESULTS

The demographical data of the participants reveled a mean age of 22.89 ±4.902. Overall, In our study Type V lip print was found to be the most prevalent (27.36%) , followed by type III, whereas Type II was the least common as shown in table 1. The lip print patterns among the ethnically Pukhtoon and other ethnic people also showed no significant difference in terms of frequency patterns as shown in table 3.

Table 1: Demographic data of Participants of the study

Designation	No. Students	Percentage
1st year student	40	12.98%
2nd year student	40	12.98%
3rd year student	38	12.33%
4th year student	36	11.68%
Final year student	29	9.41%
Employee	18	8.95%

Table 2: Shows a comparison of the two genders lip-print patterns frequencies

Lip-print	Male n=201	Percentage
Type I	30	14.92%
Type I'	26	12.93
Type II	22	10.94%
Type III	40	19.9%
Type IV	28	13.93%
Type V	55	27.36%

Table 3: Comparison of lip prints according to Ethnicity

Lip-print	Ethnicity	
	Pukhtoon%	Other%
Type I	25(12.43)	5(2.48)
Type I'	20(9.95)	6(2.98)
Type II	18(8.95)	4(1.99)
Type III	40(19.9)	13(6.46)
Type IV	18(8.95)	10()
Type V	48(23.88)	7(4.97)
Total	169(84.07)	45(22.38)

DISCUSSION

There should always be several techniques of identifying people on hand in case of a crime, an accident, or a large-scale catastrophe. A consistent approach for recording lip prints is still needed, however, as a beneficial supplement to fingerprints and teeth in the same operation. It's also critical from a variety of perspectives what kind of lipstick you're wearing. After each usage, the lipstick should be sanitised to prevent the spread of disease. Using a pencil lipstick, which could be soaked in povidoneiodine and sharpened after each use, was utilised for this purpose.[15]

Since this classification system by Suzuki and Tsuchihashi has been widely utilised in the literature and is straightforward to use, we decided to implement it. Human identification and criminal investigations are two areas where lip prints are frequently employed.[14] The demographic data also reveals that the study had a disproportionately low number of ethnic people other than Pukhtoons (12.33% vs 87.66% respectively). This makes a ratio of about 1:7. The reason behind this is also the low population of other ethnicities residing within this region.

Both these factors are to be kept in mind when a comparison is to be made between the lip print patterns between the two genders and also between the two ethnic groups that is the Pukhtoons and the other ethnicities. (Kukreja 2020)

Examination of the lip prints reveals that none of any of the two lip prints were the same in any two individuals. This findings was consistent with all the previously done studies on the lip prints.[16,17] This therefore signifies that lip prints can be conveniently be used for personal identification, in various circumstances, like a criminal can be linked back to a crime scene by matching of any lip print left behind on any object or living surface.

When comparing the data of lip print frequency of our study with that of the previous data available internationally. There appears to be a stark difference in terms of the pattern frequency in our study as compared to a study done in the neighboring country of India our study showed the most common type of lip print pattern to be type V (26.6%) while the second most common type was Type III (19.5%). while J Augustine et al. performed a similar study in Maharashtra India revealing the most common and second most common pattern to be Type III (48.67%) and Type II (19%).[18]

A comparison with the local data also has some differences in the pattern distribution. A study done in urban region of Karachi, revealed the most common pattern of lip print to be Type III (44.51%) followed by Type II (31.57%).[19] This difference in the statistics could be explained by the relative the homogenous ethnic distribution in our study as compared to the other studies. The results of our study in this regard are similar to an Iranian study which also revealed the Type V to be most common pattern.[20] Furthermore, it can be argued that Pukhtoons being descendants from historic region of Iran and Afghanistan it seems plausible that the results of our study do match closely to data originating from Iran.[20]

In a comparison with another local study done at University Medical and Dental College, Faisalabad the lip print frequency patterns turned out to be most common lip print pattern Type I (66%), followed by Type II (17.3%),and then Type IV (7.1%). While our study revealed that Type III and Type I patterns were the most common ones, the discrepancy noted can again be either a result of ethnic differences among the samples or may be by chance.[21]

As already mentioned our sample in terms of ethnicity had quite few participants of ethnicity other than Pukhtoon and an generalization on this would be unreliable. However analysis of the little sample we had revealed no significant difference (p=0.867) in lip print frequency based on the ethnicities of the participants. This was in agreement with studies done previously.[22,23] In contrast a study done in India showed different frequency distribution for the lip prints among different ethnicities.[24] This however is an interesting prospect with conflicting material in the existing literature and needs further investigation.

CONCLUSION

It might be said that lip prints are distinctive, and that using them to identify people. The results showed that print of any two lips were not matched exactly. The patterns did not reveal any significant variability with regards to gender or ethnicity. Thus, trivializing the concept that lip prints can be used as a good indicator for gender determination.

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