ANALYSIS OF LIPPRINT PATTERNS IN MALE AND FEMALE

SUBMITTTED BY

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Signature of the Student

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It is hereby certified that this is the Bonafide work done by **Mr. Raghul Krishna S N** during the odd semester of the academic year 2023-2024 and submitted for the III Internal

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ABSTRACT

Lips consist of wrinkles or grooves on their vermillion border which forms a pattern, and by studying these patterns, various aspects can be determined like personal identification, race determination, sex determination, etc. The study of lip prints is called Cheiloscopy. The lip prints are unique to individuals. The present study is an attempt to compare the lip print patterns between males and females and to ascertain whether there are any patterns which are abundant in either male or in females. The vermillion lip margin is lined with sweet and sebaceous glands. When the secretion of these glands and saliva's moisturising properties come into contact with a surface, lip impressions are created. One could create circumstantial proof based on the existence of lip prints. Lip prints have been recommended as additional tools in forensic investigations of crimes due to the increasing complexity of crime and criminals' use of trail-covering preventative measures during the commission of a crime. Cheiloscopy may therefore be helpful in creating a profile of an offender. Sex can be identified from the lip prints by analysing the thickness of the prints too, as male lips were found to be thicker as compared to female lips. This Paper analyses and interprets the lip print patterns and sees if lip prints can be used as a positive means of sex identification.

Key words: Lip prints, Gender, Patterns, Cheiloscopy.

INTRODUCTION

Lip prints are normal lines and fissures in the form of wrinkles and grooves present in the zone of transition of human lip, between the inner labial mucosa and outer skin, examination of which is known as cheiloscopy. This is unique for individuals, as finger prints. Research studies and information regarding the use of lip prints as evidence in personal identification and criminal investigation in dentistry, although age old, are scanty. However, studying in depth and establishing further facts and truth in lip prints will certainly help as useful evidence in forensic dentistry**. (1)**

Lip prints are rarely used in criminal cases as its credibility has not been resolutely established in our courts. There are two ways of possibly using lip prints:

1. Print patterns for identification
2. Chromatography to match lipstick marks

Identification plays a major role in any crime investigation. The shape of creases on the lips has distinct features like fingerprints. Larger studies on Lip print have been carried out by various scientists called as tool for human identification in both civil and criminal cases. The lip crease shape exists on the vermilion border of the lip, which is relatively moveable and lip prints may vary in form as per the pressure, direction and method used in making the print. It completes by enlightening the students with the element that the likelihoods to use the red part of lips for identification are extensive than it is commonly thought. (2)

Fischer, 1902 was among the first to take notice of the biological phenomenon of systems of furrows on the red part of human lips in the year 1902. While the use of lip prints in personal identification and criminalization was first recommended in France by Edmond Locard as early as 1932. Le Moyne Snyder was the first to introduce a case in which lip prints

helped the crime investigators in an unusual way. Suzuki and Tsuchihashi were among the first to classify the various patterns present on the human lips. (3)

CLASSIFICATION -

i. Straight line
ii. Curved line
iii. Angled line
iv. Sine-shaped line

Suzuki and Tsuchihashi, in 1970, developed a grouping method of lip prints:

Suzuki and Tsuchihashi classification -

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.

This organization is the very generally used for recording the pattern on the lips. (2)

In dead, lip prints have obtained within 24 hours of time of death to prevent any erroneous data that would result from post-mortem alterations of lip. (5)

Embryology of lip prints:

By the end of 4th week processes and structures from which the entire face and lips develop can be identified. During development the mandibular processes of the two sides grow toward each other and fuse in the midline to form the inferior margin of the stomodeum which gives rise to the lower lip. The superior margin of the stomatodeum is bounded by upper lip which is formed from the maxillary process and frontonasal process. The overlying skin is derived from the ectoderm and the musculature is derived from mesoderm of the second pharangeal arch. Expectedly, the lip prints also develop as the lip develops; which remains unaltered from six week of intrauterine life till death. However, Randhawa et al. suggested that age (younger and older ages) affects the visibility and clarity of lip print. (4) Lip prints left on crime scenes such as glasses, cups or even on documents can be compared to a suspect lip print. If a match is found, it can serve as strong evidence in court. Lip prints can be used in anthropological studies to understand the genetic diversity of different populations. In the present study, we have recorded and evaluated various lip print patterns among the patients who had reported to the department and analysed the upper and lower lip-wise and gender-wise predilection of the lip print pattern. (6)

REVIEW OF LITERATURE

1. May/June 1991 issue of Journal of Forensic Identification by T. R. Williams. Before conducting any further investigation, it is advisable to check and photograph anything that can contain lip prints, such letters, windowpanes, cigarette butts, drinking glasses, and cups.

2.Lip prints: An overview in forensic dentistry - L Vamsi Krishna Reddy, Journal of Advanced Oral Research 2 (1), 17-20, 2011 - Establishing a person's identity can be a very difficult process. Dental, fingerprint and DNA comparisons are probably the most common techniques used in this context.

3. Lip prints–an aid in identification- Prateek Rastogi, Amrita Parida, Australian Journal of Forensic Sciences 44 (2), 109-116, 2012 - Lip prints are unique to each individual. They remain the same throughout life and are uninfluenced by environmental changes, diseases and trauma.

4. Role of lip prints as a novel tool in personal identification: An overview- Puneet Kumar, Roshni Dupare, Prince Kumar, Vineet Gupta - SRM Journal of Research in Dental Sciences 4 (1), 21-24, 2013 - Establishing a person's identity is a very important process in civil and criminal cases. In the field of forensic sciences, the lip prints have been proven to be an imperative tool in identifying a person positively.

5. A study of lip prints and its reliability as a forensic tool - Yogendra Verma, Arouquiaswamy Einstein, Rajesh Gondhalekar, Anoop K Verma, Jiji George, Shaleen Chandra, Shalini Gupta, Fahad M Samadi - National journal of maxillofacial surgery 6 (1), 25, 2015 - More females showed the branched pattern and males revealed an equal prevalence of vertical and reticular patterns. There was an interobserver agreement, which was 95%, and there was no change in the lip prints over time.

METHODOLOGY

For this analysis we have collected 30 samples from both males and females (15 of each). The individuals were selected by certain parameters like people without lesion on their lips, active or passive was selected. People with known lip sensitive was avoided. For the lip print analysis, a single layer of 09-nude shade lipstick was applied evenly with the tip of cotton swab at the central portion towards the side of upper and lower lips. Subjects were asked to press their lips together to ensure that the lipstick was applied evenly. After two minutes, the subjects were asked to press their lips on the A4 paper to create the lip prints. For analysis, each lip impression was divided topographically into four quadrants: first quadrant (upper right hemiarch); second quadrant (upper left hemiarch); third quadrant (lower right hemiarch) ; fourth quadrant (lower left hemiarch).For further categorization of lip impression, the method proposed by Suzuki and Tsuchihashi was followed in which Type 1 presented distinct vertical grooves that crosses the entire lip; Type 1' was similar to Type 1 but not extended the entire lip surface; Type 2 was branched grooves; Type 3 showed crossed grooves; Type 4 presented reticular grooves and Type 5 included grooves and the samples was examined using magnifying lens.

Materials required:

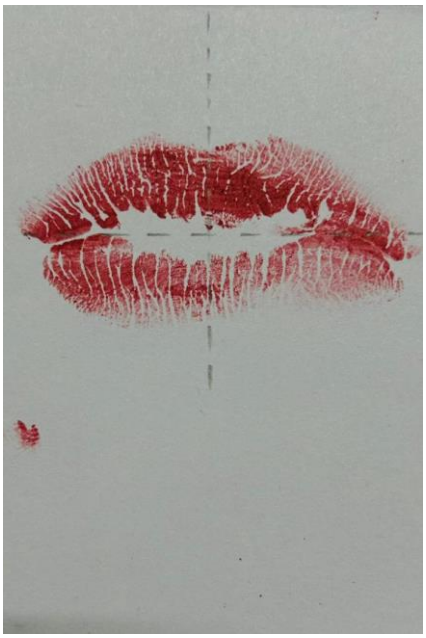
1. Lip stick 09-nude shade
2. A4 sheet paper
3. Stationary items:

- pencil
- scale
- eraser

4. Magnifying lens

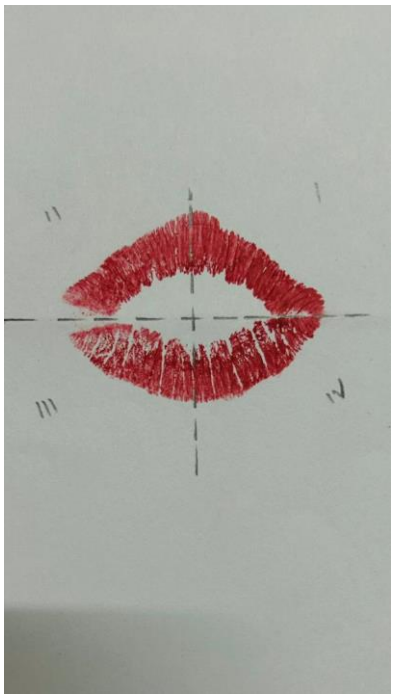
The lips were visualized using a magnifying lens and the type of patterns were analyzed on the basis of classification by Suzuki and Tsuchihashi.

FEMALE SAMPLES



Sample-1

Sample-2



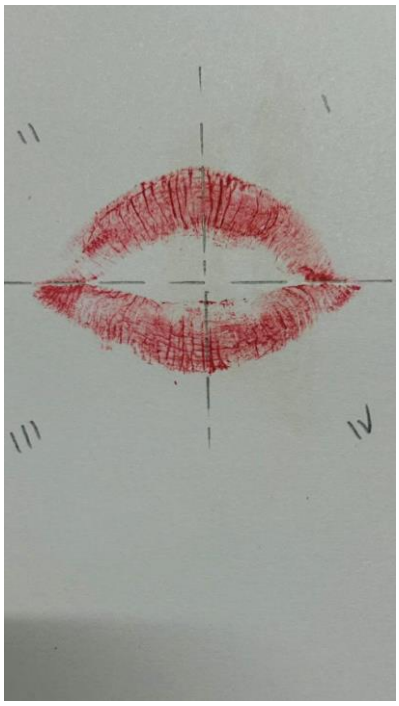
Sample-3

Sample-4

MALE SAMPLES

Sample-1

Sample-2



Sample-3

Sample-4

RESULT

In our study, we collected 30 individuals lip prints in which 15 lip print samples are from the male and 15 samples from female is used in our analysis. The findings show different type of lip print pattern in each individual and their unique characteristics. This research was compatible with the results obtained in similar studies led by Tsuchihashi and Suzuki. Regarding the lip print patterns we have basic types which includes type 1, 1',2,3,4 and 5. In our research we have found out that in females the most commonly seen pattern is type 1 and type1'. An approximate percentage of lip print patterns in females- type 1 (59.3%), type 1' (16.2%), type 2 (12.1%), type 3 (9.1%), type 4 (3.3%) and type 5 (0%). then the same procedure is carried out in male where they have type 1, type 2 and type3 are most commonly seen in our research with a percentage of in type 1 (33.8%), type 1' (8.6%), type 2 (25.2%), type 3 (16.7%), type 4 (12.3%) and type 5 (3.4%). So, from analysis these outcomes, the distribution of type of lip grooves in relation to gender conclude that, in males and females the most common type found is type 1.

The order of Appearance of Lip print Patterns in Females is,

Type 1 > Type 1’ > Type 2 > Type 3 > Type 4 > Type 5

The order of Appearance of Lip print Patterns in Males is,

Type 1 > Type 2 > Type 3 > Type 4 > Type 1’ > Type 5

CONCLUSION

Cheiloscopy has been proven to be a reliable technique to establish the correct identity of a person. We are concluded that the data stats found on the study lip patterns showed a statistically significant difference between the genders. The lip prints of the subjects did not match with each other. The study reveals that lip prints behold the potential of determination of the sex of the person. Limitations of the study were that since the lip print was produced with a substantially mobile portion of the lip, the same person can produce different lip prints according to the pressure, direction, and method used in taking the print. Also, the amount of lip stick used can affect the print. The existence of some pathological conditions (lymphangiomas, congenital lip fistula, syphilis, lip cheilitis, etc.) can invalidate the cheiloscopic study. Using the lip print pattern for identification of a person is one of the unique practices. The characteristics of lips formed by lip grooves are as individually distinctive as the ridge characteristics of finger prints. The patterns of lip prints showed significant sexual dimorphism between males and females. Therefore, lip print pattern can be used as one of the weapons for personal identification of an individual.

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