

Original Article

Analysis of Lip Prints in 12 Different Compartments of Lips in Fifty Female Population: An Observational Study

J Senthamil Sindhu, TN Uma Maheswari

From the Department of Oral Medicine and Radiology, Saveetha Dental College, Saveetha University, Chennai, Tamil Nadu, India

ABSTRACT

Aim: To find out if there are different types of lip print pattern in each compartment of lip. To find out the predominant type of lip print in each compartment of the lips and most predominant type of lip print pattern found in females.

Materials and Methods: This study was conducted in 50 females who had morphologically healthy lips devoid of any congenital or developed abnormalities. The lip prints were recorded in micro slides by applying lip stick. The upper and the lower lip prints were divided into two halves as left and right. The right and the left half are further divided into central, middle, lateral and therefore the lip print analysis was done in 12 compartments of the lip print samples.

Statistical Analysis: The collected data was analysed with SPSS 16.0 version. To describe about the data descriptive statistics frequency analysis, percentage analysis were used.

Results: The predominant type of lip print type seen in different compartments are as follows type I (40%) in upper right lateral, type II (44%) in upper right middle, type V (32%) in upper right centre, type IV(32%) in upper left centre, type II (40%) in upper left middle, type I (50%) in left lateral, type III (42%) in lower right lateral, type II (32%) in lower right middle, type V (66%) in lower right centre, type V(42%) in lower left centre, type II (36%) in lower left middle, type II (44%) in lower left lateral. The predominant type of lip print pattern including both upper and lower lip is type II followed by type V, type I, type III and type IV.

Conclusion: Our study has once again proved the uniqueness of the lip prints and its importance in personal identification. Even though the collection and storage of lip prints in glass slide is superior to the conventional methods the samples get easily distorted. Further studies have to be done in males lip print samples for sex determination using lip prints. Also different digitalizing techniques have to be developed for easy storage and retrieval of the lip prints which would be useful in individual identification as well as forensic investigations.

KEY WORDS: Detailed imaging, female population, lip prints

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INTRODUCTION

The uniqueness of lip prints has gained importance in forensics for human identification as they are being used for crime detection. Cheiloscopy is a forensic investigation technique, in which a person is identified based on characteristic arrangement of lines appearing on the red part of the lips. Identification plays a vital role in crime investigation. The pattern of wrinkles in lips has been proved to have individual characteristics as fingerprints. Although the patterns of groove in lip prints were described as in early 1902 by R. Fischer, more extensive studies on the uniqueness of lip prints was given by two Japanese scientists, Yasuo Tsuchihashi and Kazuo Suzuki in 1970.^[1]

MATERIALS AND METHODS

The study was carried out in a total of fifty female population of Indian origin between 21 and 25 years of age. Individuals who had any developmental or pathological change in lips

were eliminated from the study. In the study, the classification given by Tsuchihashi^[1] was taken into consideration. Each individual was informed in detail about the procedure, and informed consent was collected from them. Lip prints can be collected in different ways by applying lipstick and recording in tracing sheet,^[2] or using tissue papers,^[3] adhesive tapes,^[4] Scotch tapes,^[5] and in bond papers.^[6] In this study, both the upper and lower lips were recorded in a glass slide by applying lipstick on both the lips and pressing it against the glass slide with a gentle pressure starting from the right side of the lip through the middle to the left side of the lip so that the whole lip is recorded at a stretch. The slides were then air-dried and stored in a slide box. In the present study, the upper and lower lips are divided into two halves, right and left, which is further

Address for correspondence:

Dr. J Senthamil Sindhu, E-mail: ssindhujaya@gmail.com

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divided into three compartments, namely, central, middle, and lateral compartments; as a result, each lip is divided into six compartments, and in total, the lip print analysis was done in twelve compartments of the lips [Figure 1].

The collected data were analyzed with SPSS 16.0 version (SPSS Inc). To describe about the data, descriptive statistics, frequency analysis, and percentage analysis were used.

RESULTS

The predominant type of lip print pattern in the upper right lateral compartment is Type I (40%), followed by Type II (32%), Type V (14%), Type III (12%), and Type IV (2%). The predominant type of lip print pattern in the upper right middle compartment is Type II (44%), followed by Type V (20%), Type III and Type I (14%), and Type IV (8%). The predominant type of lip print pattern in the upper right center compartment is Type V (32%), followed by Type IV (24%), Type I (20%), Type II (18%), and Type III (6%). The predominant type of lip print pattern in the upper left center compartment is Type IV (32%),

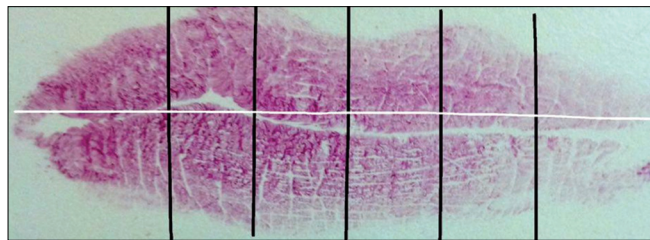
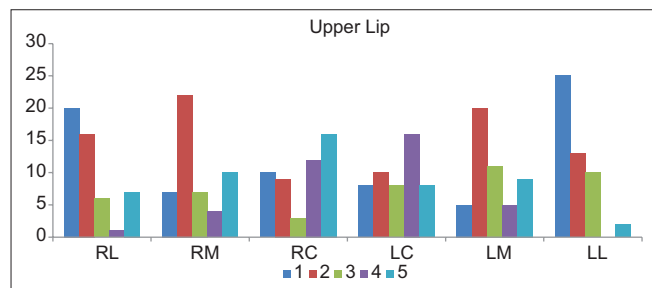
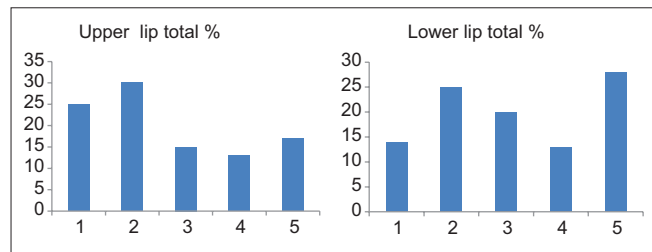


Figure 1: Lip print divided into 12 segments starting from upper right is divided as upper right lateral, upper right middle and upper right central, upper left central, upper left middle and upper left lateral and same follows for the lower as lower right and left central, middle and lateral



Graph 1: Distribution of Types I-V lip print patterns in six compartments of the upper lip in percentage; where RL: Right lateral, RM: Right middle, RC: Right center, LC: Left center, LM: left middle, LL: Left lateral

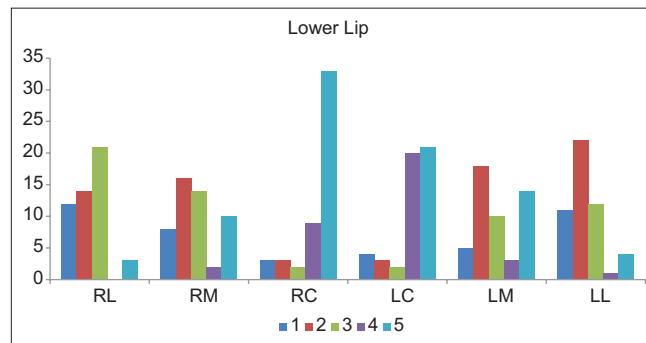


Graph 3: Total percentage of Types I-V lip print pattern in the upper and lower lip, respectively

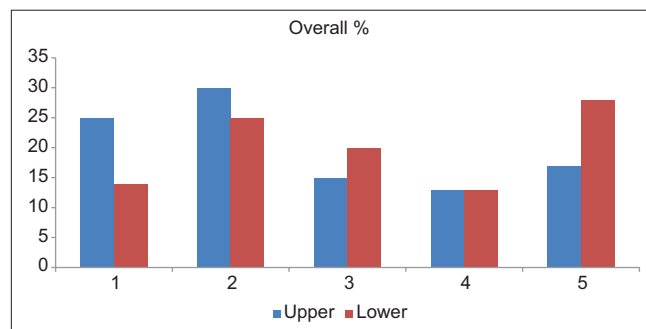
followed by Type II (20%) and Type I, Type III, and Type V (16%). The predominant type of lip print pattern in the upper left middle compartment is Type II (40%), followed by Type III (22%), Type V (18%), and Type I and Type IV (10%). The predominant type of lip print in upper left lateral is Type I (50%), followed by Type II (26%), Type III (20%), and Type V (4%). The most common type of lip print pattern in the upper lip is Type II (30%), followed by Type I (25%), Type V (17%), Type III (15%), and Type IV (13%). The most common type of lip print pattern in the lower lip is Type V (28%), followed by Type II (25%), Type III (20%), Type I (14%), and Type IV (13%). In general, the most predominant type of lip print to least predominant type of lip print in females is Type II, followed by Type V, Type I, Type III, and Type IV [Graphs 1-4].

DISCUSSION

Identification of an individual in mass disasters or criminal investigations can be narrowed down with the help of age, sex, race, height, etc., However, the unique identification sources for an individual includes fingerprints and lip prints, among which fingerprints are already widely used in practice. Lip print analysis is becoming rapidly popular among the researchers as it can be used as a valuable component of forensic investigations in many crime investigations. Cheiloscropy is said to be analogous to fingerprint analysis and is a genuine subspecialty of forensic odontology.^[7] Lip prints can be valuable source of evidence in criminal scenes where



Graph 2: Distribution of Types I-V lip print patterns in six compartments of the lower lip in percentage; where RL: Right lateral, RM: Right middle, RC: Right center, LC: Left center, LM: Left middle, LL: Left lateral



Graph 4: Overall percentage of Types I-V lip print patterns in lower and upper lip

there are no fingerprints. Latent lip prints can be developed from almost all the inanimate objects such as cigarette butt, glass, tape, floor, and straw. This is attributed to the fact that the vermilion border of the lips has minor salivary glands and the edges of the lips have sebaceous glands, which secrete oil and provide moisture to the lips, respectively.^[8] In this study, it was observed that no two individuals had same type of lip print which proves the uniqueness of lip prints as first described by Tsuchihashi,^[1] and moreover, the lip print patterns in one compartment of the lip is not the same as that of any other compartment. In this study, it was observed that the most common type of lip print pattern in females is Type II and the least common type of lip print pattern in females is Type IV, which is similar to the results of Uma Maheswari^[2] and is in contrast to Sharma *et al.*,^[9] Koneru *et al.*,^[10] and Peeran *et al.*,^[11] who have stated that Type I pattern is most common in females. In our study, the most predominant type of lip print pattern in females Type II, which is similar to the study results of Kumar *et al.*^[12]

CONCLUSION

More studies on detailed imaging of lip print patterns have to be carried out to obtain finer detailing of the lip prints which can be of immense importance in personal identification. Even though the collection and storage of lip prints in glass slide are superior to the conventional methods, the samples get easily distorted. Furthermore, different digitalizing techniques have to be developed for easy storage and retrieval of the lip prints which would be useful in individual as well as forensic investigations.

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CONFLICTS OF INTEREST

There are no conflicts of interest.

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