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Editorial Office Address

Department of Forensic Medicine & Toxicology, Third Floor, Library Building, Seth G S Medical College & KEM Hospital, Parel, Mumbai-400 012. Email id: mlameditor@gmail.com Phone: 022-24107620 Mobile No. +91-9423016325



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Original Research Article

A study of Lip Print Pattern Among the South India Population

Ravikumar R^{a*}, Darshan C^b

^aAssociate Professor, ^bJunior Resident, , Department of Forensic Medicine & Toxicology, Kodagu Institute of Medical Sciences Madikeri, Karnataka, India. Pin-571201

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Abstract

Cheiloscopy, the study of lip prints is an upcoming tool for the identification of individuals. Lip prints are unique to an individual just like the fingerprints and do not change during the life span of a person. Previous work done on the subject reveals that lip prints show differences according to the sex, race or the ethnic origins of an individual. The study was taken up to determine the predominant lip print pattern in South Indian population. 100 male and 100 female subjects of South Indian origin were included in the study. . The study was conducted during the period from July 2018 to September 2018. The lip print patterns recorded were studied and classified according to Suzuki's classification. The predominant type in each quadrant was noted and the percentage was calculated. It was found that Type II (branched grooves) was the predominant pattern.

1. Introduction

The wrinkles and grooves on labial mucosa, called as sulci labiorum forms a characteristic pattern called as lip prints and the study of which is referred to as cheiloscopy. ^[1] The lip prints are unique and can be identified as early as the 6th week of intrauterine life. Thereafter, lip groove patterns rarely change, resisting many afflictions. ^[2] Fischer was the first anthropologist to describe the furrows on the red part of the human lips. The use of lip prints were first recommended as early as in 1932 by Edmond Locard (1877-1966), one of France's greatest criminologists. Le Moyne Snyder in his book Homicide Investigation, written as early as 1950, mentions the possible use of lip prints in the identification of individuals. ^[3, 4] India is a vast country with 29 states, inhabited by diverse populations of tribes, castes, religions, and migrant groups. Although they share similar physical features,

they show differences in cultural, anthropologic, and genetic traits. ^[5] The aim of this study was to study the most prevalent lip print pattern in South Indian population of India.

2. Materials And Methods:

The study group comprised of both male and female students of South India of age between 18 – 25 years old was chosen. The lip prints of 200 randomly selected students were taken of which 100 are males and 100 females. The study was conducted during the period from July 2018 to September 2018. The whole method and objective of the study was explained to them clearly and informed consent was taken. The ethical clearance for the study was obtained from the institutional ethical committee before commencing the study.

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***Corresponding author:** Dr Ravikumar R, Associate professor, Department of Forensic Medicine & Toxicology, Kodagu Institute of Medical Sciences Madikeri, Karnataka, India. Pin-571201 E-mail ID: dr_ravikumar_fm@yahoo.com (M): +91-94483 87665

The materials used were as follows: Skin care cream – NIVEA, A strip of paper, Adhesive tape, Magnifying lens, Brush (Fingerprint brush\squirrel hair brush), Finger print dusting powder (black) and Blower.

In this study, the classification of patterns of the lines on the lips proposed by Suzuki and Tsuchihashi Y was used to analyze the lip prints.

Type I: A Lip with clear-cut groove running vertically across the lip.

Type I¹: Partial length groove of Type I.

Type II: Branched groove.

Type III: Intersected grooves.

Type IV: Reticular pattern

Type V: Undetermined.

3. Results:

The study of lip print patterns from 90 males and 92 female's students of South India were correctly identified and revealed the following observations. Type III was predominant in males followed by Type II and Type V was seen least in males. Females showed predominance of Type II and Type I pattern and Type IV was seen least in females. Most predominant type of lip prints in study population, taking both the upper and lower lips together is Type II which is branched grooves (Y shaped pattern) followed by Type III which is intersecting pattern and Type I (compete straight grooves) and Type I¹ (partial straight grooves). (**Table 1**)

Table 1: Gender wise predominance of Lip Print Pattern among the study Population (M-Male, F-Female)

Type	M L.Q	M R.Q	F L.Q	F R.Q	Male %	Female %
I	32	32	46	46	17.87%	24.86%
I ¹	27	27	48	48	15.08%	25.94%
II	44	44	57	57	24.58%	30.81%
III	58	58	19	19	32.40%	10.29%
IV	11	11	06	06	6.14%	3.24%
V	07	07	09	09	3.93%	4.86%

The least common type of lip print are Type IV and Type V which are reticular grooves and undetermined respectively. Quadrant wise predominance of lip prints. A total of 728 quadrants were studied in 182 individuals. Type III is more predominant in first and second quadrant of males. (**Table 2**) Third and Fourth quadrant shows predominance of Type II pattern in males. Type II is most predominant in first and second quadrant of

females. Type I and Type II is predominant in third and fourth quadrant of females.

Table 2: Percentage distribution of type of Lip Print Pattern among Population

Pattern	Total Quadrants	Percentage
I	156	21.42%
I ¹	150	20.60%
II	202	27.74%
III	154	21.15%
IV	34	4.67%
V	32	4.40%

4. Discussion:

Lip prints are very useful in forensic investigation and personal identification. Lip print is a potential and reliable method which is useful in determining the sex of an individual. In our study Type III (intersected groove pattern, 32.40%) was found to be more common in males followed by Type II (branched grooves, 24.58%). Females showed predominance of Type II (branched grooves, 30.81%) following Type I¹ (Partial length groove of Type I, 25.94%) and Type I (A Lip with clear-cut groove running vertically across the lip, 24.86%). In the present study, the most common lip print pattern found among males was Type III and type II among females which are consistent with the study done by Vahanwalla and Parekh.⁶ Similarly, Gondivkar et al⁷ reported in their study that the most predominant pattern among males was Type III pattern (51.05%) and Type II pattern (37.06%) in females was predominant in the population. While Sivapathasundaram,⁴ Verghese et al.⁸ and Sandhu et al.⁹ reported in their study that Type III, Type II, Type IV, and Type I were the predominant lip print patterns found among males and females, respectively.

In our study Type V (undetermined pattern) was seen least in males (3.93%). Type IV (reticular pattern) was seen least in females (3.24%) which are similar to the other studies.^{10, 11} The most predominant pattern in our study population was Type II (branched grooves, 27.74%) which is in accordance with the studies done by Sivapathasundaram et al., Suzuki and Tsuchihashi.^{4,11} In our study group most which had belong to the South India and Type II/branched grooves was predominant with them which is in

consistent with the studies by Prateek Rastogi et al¹⁰ and Khanapuri et al¹² who found Type II/branched grooves and Type III/Intersected groove pattern as the most predominant pattern in the people of South India where as Patil et al¹³ found Type IV/Reticular pattern as the most predominant pattern in people of North Karnataka. The study conducted in north Indian population by Bindal et al¹⁴ found that most commonly observed pattern was Type II. But studies by Augustine et al (2008)¹⁵ in the Delhi population and, Saraswathi et al (2009)¹⁶ in Kanpur population reported Type III pattern (48% and 38%). The variations in the results of the various studies conducted on different populations suggest that populations have a specific distribution of lip prints patterns and might help in identification of ethnicity.

5. Conclusion:

Cheiloscopy techniques have an equal value in relation to the other types of forensic evidences for personal identification. Thus, the study may help to add certain new aspects to the use of lip prints in forensic practice. Since lip prints behold the potential for individual identification, the study of lip prints needs to be developed further to prove its use as an effective tool for identification, such as finger prints, further studies need to be carried out on a larger sample size, preferably of different races and nations and a database on different lip prints in different population has to be created to be used as an effective tool. Results, if significant, can be of help in establishing nationality or racial origin of an individual, especially, in modern scenarios where international and intercontinental travelling and mixing is common.

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