

Sex Determination Among North Indian and North East Indian Population Using Lip Prints and Finger Prints. A Comparative Study

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ABSTRACT

Background: Dental records, fingerprint, DNA comparisons are the most common techniques used for a person's identification, allowing fast and secure identification processes. The potential of lip prints to determine sex has been well exhibited and documented. Very few studies have been conducted for comparing lip print and finger print and for population identification.

Materials and Methods: The sample comprised of 100 subjects, which were divided into 4 groups of 25 individuals each, Group 1 North Indian male, group 2 North Indian Female, Group 3 North East male and Group 4 North East Indian female. Lip prints and finger prints each individual were recorded the results were statistically analysed by using Chi-square test.

Results: Type I lip print and loop type finger print was predominant in group 2, type III lip print and whorl type finger print was predominant in group 1, type IV lip print and loop type finger print in group 4 and type 1 lip print and arch type finger print in group 3.

Conclusion: Difference between the lip print patterns and finger print in two populations exists, although subtle. However, larger sample size is necessary to derive concrete conclusions.

Keywords: Cheiloscopy, Finger print, Identification.

INTRODUCTION

The most basic concept in forensic odontology is centered on a form of pattern recognition and comparison. However, Forensic Odontology, as a science, did not appear before 1897 when Dr. Oscar Amoedo wrote his doctoral thesis entitled "L'Art Dentaire en Medecine Legale" describing the utility of dentistry in forensic

medicine with particular emphasis on identification¹. Identity is unique to every individual an important factor in cases of theft, criminal investigations, Mass disasters, Dental records, fingerprint & DNA. Comparisons are the most common techniques used for a person's identification, which is faster and secure. The potential of lip prints to determine sex has been well exhibited and documented². Limited data is

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available for comparing lip print and finger print for population identification. Sulci laborum are the wrinkles and grooves present on the labial mucosa that forms a characteristic pattern which is called as lip prints. The study of lip prints is known as Cheiloscopy. Cheiloscopy is a forensic investigation technique that deals with identification of humans based on lips traces³. Lip prints have to be obtained within 24 hours of time of death to prevent erroneous data that would result from post mortem alterations of lip⁴.

A series of forensic odontological studies on the morphology of the lips and the pattern produced when they are impressed on to a variety of surfaces forms a worthy additional weapon for personal identification⁵. The biological phenomenon of systems of furrows on the red part of human lips was first noted by anthropologists. R Fischer was the first to describe it in 1902⁶. Use of lip prints in personal identification and criminalization was first recommended in France by Edmond Locard⁷. The wrinkles and grooves which are visible on the lips have been named by Tsuchihashi as "sulci labiorum rubrorum".

The skin on the palmar and plantar surface is wrinkled, with narrow minute ridges which are known as friction ridges. And commonly known as finger prints⁸, finger prints are unique for each and every individual, every individual has a different set of finger print which is used for personal identification. A finger print is an impression of these friction ridges. Study of finger prints is known as dermatoglyphics⁹.

AIM & OBJECTIVES

The aim and objective of this study was to Predominant lip print and finger print pattern in males and females in relation to North Indian and North East Indian population. And to find out the differences in the expression of pattern in both the population.

MATERIAL AND METHODS

The sample comprised of 100 subjects, which were divided into 4 groups of 25 individuals each, Group 1 comprises of North Indian male, group 2 comprises of North Indian Female, Group 3 was of North East male and Group 4 comprises of

North East Indian female. Lip prints and finger prints of each individual were recorded. Lip prints were classified based on Suzuki's and Tsuchihashi's classification and finger prints were classified, based on Michael's and Kucken's classification. The results were statistically analysed by using Chi-square test.

Lip prints were classified according to

1. Suzuki's classification
2. Tsuchihashi's classification.

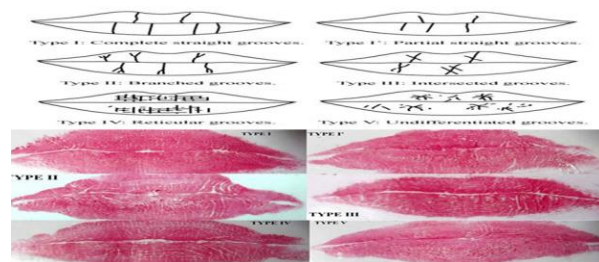


Fig 1: Types of lip prints.

Finger prints were classified according to

1. Michael's classification
2. Kucken's classification.

Exclusion criteria for finger prints

1. Permanent scars on the fingers or thumbs
2. Any kind of deformities

Material Used to record finger prints

1. white A3 sized paper
2. black inked stamp pad
3. magnifying lens

Exclusion criteria for lip prints:

1. Subjects undergoing orthodontic treatment
2. Congenital lip abnormalities,
3. Inflammation or trauma to lips
4. Hypersensitivity to lipsticks.

Material used to record lip prints

1. Red colored lip stick
2. cellophane tape
3. white A3 sized paper
4. magnifying lens

RESULT

Table 1: Percentage of different type finger prints in different ethnic groups.

S.No	Type of finger print pattern	North Indian male	North Indian Female	North east Indian male	North east Indian female
1	Arch	06(24%)	07(28%)	13(52%)	05(20%)
2	Loop	03(12%)	12(48%)	08(32%)	12(56%)
3	Whorl	14(56%)	05(24%)	04(16%)	05(20%)
4	Composite	02(08%)	01(04%)	00(00%)	01(04%)

Table2: Percentage of different type lip prints in different ethnic groups

S.No	Type of lip print pattern	North Indian male	North Indian female	North east Indian male	North east Indian female
1	Type I – complete vertical	06(24%)	13(52%)	11(44%)	06(24%)
2	Type I' – incomplete vertical	02(08%)	03(12%)	06(24%)	07(28%)
3	Type II – branched	03(12%)	01(04%)	04(16%)	00(00%)
4	Type III- Intersecting	12(48%)	04(16%)	03(12%)	03(12%)
5	Type IV – reticular	02(08%)	03(12%)	01(04%)	09(36%)
6	Type V - undetermined	00(00%)	01(04%)	00(00%)	00(00%)

1. Type III lip print and whorl type finger print was predominant in group 1.
2. Type I lip print and loop type finger print was predominant in group 2.
3. Type IV lip print and loop type finger print in group 4
4. And type 1 lip print and arch type finger print in group 3

The results were found to be statistically significant. ($p < 0.001$).

DISCUSSION

One of the most emerging methods of human identification now a day, which is originated from the criminal and forensic practice, is human lips recognition. In 1932, Edmond Locard, one of the criminologists recommended the use of lip prints in personnel identification and criminalization. Saraswathi et al¹⁰.found that intersecting pattern of lip print was more common in both males and females,as shown in table1. Our study was in accordance with the study done by Bhavana D et⁸ al which was shown in table 2.

Sharma et al¹¹. Concluded that Type I and Type I' lip patterns were most commonly seen in females and that Type IV was seen most commonly in males. In our study type III lip print was more common in north Indian males and type I in north east Indian males

Type I was common in North Indian Females and type IV in North East Indian Female

No study till now have been reported regarding comparison of lip print and finger print in north Indian and north east Indian population.

SUMMARY & CONCLUSION

It is known that individual parameters, i.e., lip patterns, finger print patterns play an important role in forensic identification. Correlation of these parameters in our study show significant association. Hence, these combinations can be used in individual identification.

Since India consist of diverse ethnicity therefore this study can be useful in determining in different ethnic group as well as in sex determination.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Bernstein M. Forensic odontology. In: Eckert WG. editor. Introduction to Forensic Sciences. 2nd ed. Boca Raton, FL: CRS Press; 1997, p. 304-51
2. Adamu LH, Taura MG, Ojo SA, Dahiru A, Sadeeq A, Umar KB. Relationship of thumb prints and lip prints among Nigerians. *IOSR-JDMS*. 2013; 9 (2):12-7.
3. Pretty IA, Sweet D. Anatomical location of bitemarks and associated findings in 101 cases from the United States. *J Forensic Sci* 2000;45(4):812-4.
4. Brown KA, Elliot TR, Rogers AH, Thonard JC. The survival of oral streptococci on human skin and its implication in bite-mark investigation. *Forensic Sci Int* 1984; 26:193-7.
5. Harvey W. Bites and bite-marks. In: Dental identification and forensic odontology. London: Henry Kimpton Publishers; 1976. p. 88-123.
6. Wood RE, Kirk NJ, Sweet DJ. Digital dental radiographic identification in the pediatric, mixed and permanent dentitions. *J Forensic Sci* 1999; 44(5):910-6.
7. Willems G. A review of the most commonly used dental age estimation techniques. *J Forensic Odontostomatol* 2001; 19(1):9-17.
8. Bhavana D, Ruchi J, Prakash T, Kalyan JL. Study of fingerprint patterns in relationship with blood group and gender- a statistical review. *Res J Forensic Sci*. 2013; 1(1): 12-7.
9. Nagasupriya A, Dhanapal R, Reena K, Saraswathi TR, Ramachandran CR. Patterns - "A crime solver". *J Forensic Dent Sci*. 2011; 3(1): 3-7.
10. Saraswathi TR, Mishra G, Ranganathan K. Study of lip prints. *J Forensic Dent Sci*. 2009; 1:28-31.
11. Sharma P, Saxena S, Rathod V. Cheiloscopy: The study of lip prints in sex identification. *J Forensic Dent Sci*. 2009;1:24-7.