



## Original Article

# Assessment of Lip Print Patterns among the People of Bihar

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## Abstract

**Objectives:** To determine the predominant lip print type in the Bihar population of India.

**Methods:** In this cross-sectional study, 200 subjects of both sex (100 males and 100 females) aged between 25-40 years whose family origins were from Bihar were studied. Young adults without any disease related to lips, with normal lip mucosa were included in the study. The present study evaluates the pattern of lip print patterns among males and females and the findings of the study are compared with the available data.

**Results:** Out of the 200 lip print patterns studied, Type I (34.5%) were the most common pattern followed by Type IV (26%) and Type V (4%) being the least common pattern. In males, Type IV, Type I and Type II were 44%, 27% and 3% respectively while in females Type I were 42%, Type I' were 24% and Type V were 4%.

**Conclusions:** No two individuals have similar lip print impressions. Lip prints are unique to individuals and may help in personal identification. Further studies with larger sample size are required to establish that lip prints are unique like finger prints and can be used as a tool for identification in medicolegal cases.

**Keywords:** Lipprint, Cheiloscopy, Type I, Type I', Medicolegal, Identification.

## Introduction

The grooves present on the human lips are unique to each person and can be used to determine identity. The study of these grooves or furrows present on the red part or the vermilion border of the human lips is known as cheiloscopy<sup>[1]</sup>. The word cheiloscopy is derived from Greek word 'chelios' meaning 'lips' and 'skopein' meaning 'see'. This biological phenomenon was first noted by anthropologists. R. Fischer was the first to describe it in 1902<sup>[2]</sup>. The pattern of lip print is unique to an individual<sup>[3]</sup> and thus can be used to

fix the identity of a person<sup>[4]</sup>. Individual elements of vermilion zone patterns also contribute to the uniqueness of lip prints and thus help in individual identification. Coward et al suggested that the lip print patterns are genetically determined. The fact that these remain stable even after years, they are valuable as forensic research tool dealing with the personal identification<sup>[5]</sup>. Cheiloscopy is similar to dactyloscopy as both are consistent, stable and allow establishing a classification i.e. these imprints recover even after undergoing alterations like minor trauma, inflammation and infections

like herpes<sup>[5,6]</sup>. In countries such as Poland and USA, cheiloscropy has been used to identify criminals<sup>[7,8]</sup>. Tsuchihashi named the wrinkles and grooves present on the lips as 'sulci labiorum rubrorum'. Kazuo Suzuki and Yasuo Tsuchihashi (1971) devised their own classification of six different types of grooves as shown in Table- 1<sup>[9]</sup>. The previous work done in the past showed that different racial and ethnic groups show differences in the predominant lip print pattern. So, the present study was undertaken to determine the predominant lip print type in the Bihar population of India.

### Materials and Methods

This cross sectional study was conducted at Department of Forensic Medicine and Toxicology, IGIMS, Patna, Bihar. Subjects were recruited after taking written informed consent from them. A total of 200 subjects of both sex (100 males and 100 females) aged between 25-40 years whose family origins were from Bihar were recruited in the study. Young adults without any disease related to lips, with normal lip mucosa were included while subjects having any gross congenital deformities of lips (e.g. cleft lip), and those with any inflammation, allergic to the lip stick, and with any kind of disease were excluded from our study. Lip prints were recorded on a white non-absorbent bond paper. The general information of the subjects like age, sex, occupation, name and signature were recorded on the consent form.

**Armamentarium:** A dark colored, non-glossy, non-metallic lipstick, cellophane tape/scotch tape, White bond paper, and magnifying lens.

**Lip print recording procedure:** The subjects were asked to clean their lips thoroughly with soap and water and then dried with tissue paper. Then starting at the midline moving laterally, lipstick was applied uniformly on the lips. The glued portion of cellophane tape strip was placed over the lips and a lip impression in the normal rest position of the lips by applying it in the centre first and then applying uniform pressure towards the corner of the lips; The cellophane tape strip was carefully lifted from the lip from one end to the other, to avoid smudge of the print. The cellophane strip was then stuck to the white bond paper (A4 size) for permanent record purpose and then evaluated using magnifying lens according to Suzuki and Tsuchihashi classification.

### Results

In our study, it has been observed that no two lip impressions were similar, and none of the individuals had same type of lip print pattern. The most prevalent pattern in males was Type IV (44%) followed by Type I (27%), whereas Type II (3%) was the least common variant. The most common lip print pattern in females was Type I (42%) followed by Type I' (24%), whereas Type V (4%) was the least common variant. Overall, Type I (34.5%) was most prevalent, followed by Type IV (26%), whereas Type V (4%) was the least common pattern.

**Table 1** Suzuki and Tsuchihashi's Classification of Lip Prints

TYPE	DESCRIPTION
I	The clear-cut vertical grooves that run across the entire lips
I'	Grooves similar to Type I but do not cover the entire lip
II	Branched grooves (branching Y-shaped pattern)
III	Criss-cross pattern
IV	Reticular patterns
V	Miscellaneous

**Table 2** Distribution of type of Lip Prints

LIP PRINT PATTERN	MALES		FEMALES		TOTAL	
	Number	Percentage	Number	Percentage	Number	Percentage
Type I	27	27%	42	42%	69	34.5%
Type I'	10	10%	24	24%	34	17%
Type II	3	3%	10	10%	13	6.5%
Type III	12	10%	12	12%	24	12
Type IV	44	44%	8	8%	52	26
Type V	4	4%	4	4%	8	4

### Discussion

The commonest lip print pattern found in our study was Type 1. Various studies carried out in India, done by Sivapathasundaram et al<sup>[10]</sup>, Govindkar<sup>[11]</sup>, and Saraswathi<sup>[12]</sup>, showed type-III as predominant type whereas studies by Sharma et al<sup>[13]</sup> and Verghese et al<sup>[14]</sup> showed type-IV as predominant type. The result of the present study coincides with other studies<sup>[15,16,17]</sup> done in the past. This variation in prevalence can be explained by the ethnic and racial differences of the several cohorts studied. Cheiloscropy can be used as an identification tool in the field of Forensic medicine and dentistry.

### Conclusion

No two individuals have similar lip print impressions. Lip prints are unique to individuals and may help in personal identification. Further studies with larger sample size are required to establish that lip prints are unique like finger prints and can be used as an aid in solving medico-legal cases.

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