

## Original Article

### A Study on Lip Print Types among the Blind and Deaf Students in Sriganganagar, Rajasthan

Manjeet Kaur, Navneet Singh

<sup>1</sup>Professor and Head Department of Pedodontics, Maharaja Ganga Singh Dental College and Research Center, Sriganganagar, <sup>2</sup>Ph.D Student, Pacific University Udaipur, Rajasthan

#### Abstract:

**Objectives:** To analyze and compare sex wise predilection of lip print pattern in blind and deaf subjects. **Methods:** A total of 100 blind and deaf subjects were selected. Thin layer of lip-stick was applied on the lips of these subjects. The hinged portion of a folded paper was inserted between the lips and the subjects were asked to press their lips onto it. The lip prints, thus obtained were studied on the basis of Tsuchihashi's classification. **Results:** Type I pattern was seen in 24% of males, compared to 32% of females. Type ii pattern was observed in 18% of males and 20% of females. Type iii pattern was observed in 22% of males and 24% of females. Type IV pattern was observed in 20% of males and 12% of females. Type V pattern was seen in 16% of males and 12% of females. The distribution of the Lip print types was statistically significant  $p > 0.001$ . **Conclusion:** Lip print pattern can be used as an additional tool for personal identification and sex determination. Further work on the subject can help to make cheiloscropy a practical reality in the forensic identification process.

**Keywords:** Cheiloscropy, Lip prints, Forensic identification

Corresponding author: Manjeet Kaur, Professor and Head Department of Pedodontics, Maharaja Ganga Singh Dental College and Research Center, Sriganganagar.

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#### INTRODUCTION

Identification of an individual, living or dead is based on the theory that all individuals are Unique. Personal identification is becoming increasingly important not only in legal medicine but also in criminal investigation and identification and in Genetic Research. Cheiloscropy is a forensic investigation technique that deals with the identification of human based on the lip prints references. 1 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. It has also been suggested that variations in

patterns among males and females could help in sex determination. In 1967, Santos was the first person to classify lip grooves. He divided them into four types namely:

1. Straight line
2. Curved line
3. Angled line
4. Sine-shaped curve

Suzuki and Tsuchihashi in 1970 devised a classification method of lip prints, which is as follows:

- Type I - A clear-cut groove running vertically across the lip  
Type II - A branched groove  
Type III - An intersected groove

Type IV -A reticular pattern

Type V -Other patterns

These are most widely used classification in literature. Research suggests the conclusive evidence that lip prints are suitable for the successful comparison, analysis and identification of a person to crime. This type of study hasn't been conducted among Blind and Deaf Population. So, the purpose of this study was to document common lip patterns among Blind and Deaf Population of Sriganganagar Rajasthan, under investigation and to assess gender wise predilection of lip print patterns.<sup>2</sup>

### MATERIAL AND METHODS

This study was conducted among 100 blind and deaf students of Sriganganagar, Rajasthan (50 males and 50 females) aged 10-15 years, who were willing to participate. Ethical clearance was obtained from the institutional Ethical Committee of Jagdambha blind school Sriganganagar, Rajasthan. Consent was taken from all the participants. Students whose lips were free from pathology and had normal transition zone between the mucosa and skin were included, whereas Students having Gross deformities of lips (cleft lip, ulcers, traumatic injuries on lips) and were allergic to the lip stick were excluded. In order to classify the lip prints, the classification scheme proposed by Suzuki and Tsuchihashi was used. The lips were cleaned and a thin layer of red/brown colored lip-stick was applied on the lips. A sheet of Butter paper was folded and the "hinged" portion of the paper was inserted in between the lips and subjects were asked to press their lips onto it. It was then "unfolded" again. Employing the dental formula generally used. Lip prints were studied using a magnifying lens. All the data were entered in Microsoft excel and analyzed using SPSS package (version 12). All the data were presented as frequency and percentages. Chi square test was used to

analyze and compare the lip print patterns. The level of significance was  $P < 0.05$ .

### RESULTS

The present study was conducted to access the lip prints gender wise predilection of Lip print patterns. Lip print impressions were obtained from both males and females and were classified by Suzuki's classification. The distribution of lip print types in males and females were compared. Table 1 depicts the overall results of the present study. The distribution of various types of lip prints in upper and lower lip of both males and females have been summarized.

**Table-1**

Type	Male	Female	p-value
<b>I</b>	12	16	0.0012
<b>II</b>	9	10	0.0027
<b>III</b>	11	12	0.0017
<b>IV</b>	10	6	0.0018
<b>V</b>	8	6	0.0574
<b>Total</b>	50	50	0.001

Type I pattern was seen in 24% of males, compared to 32% of females. Type ii pattern was observed in 18% of males and 20% of females. Type iii pattern was observed in 22% of males and 24% of females. Type iv pattern was observed in 20% of males and 12% of females. Type V pattern was seen in 16% of males and 12% of females. The distribution of the Lip print types was statistically significant  $p > 0.001$

### Discussion

Crimes challenge the society in detection, diagnosis and identification of criminals. Establishing a person's identity can be a very difficult process. Dental, fingerprint and DNA comparisons are probably the most common techniques used. One of the most interesting methods of human identification is human lips recognition. Lip prints can be obtained at the crime scene from clothing, cups, glasses, cigarettes, windows and doors.<sup>3</sup> In the present study Type I lip print

patter was common in all the blind and deaf males and females. Amith V in their study found Type I to be the most predominant pattern in first and second quadrant, Type II in third and fourth quadrant among males and females, Type I pattern was predominant in all the quadrants.<sup>13</sup> Manypady compared Indian and Chinese individuals and found that the incidence of Type II pattern was highest among Indians.<sup>4</sup> In our studied , we found Type I as the most predominant pattern in all the male students followed by Type iii, Type iv, Type ii, and Type V and in female candidates female we found Type I followed by Type iii, Type ii, Type iv, and Type V . Annie J et al in their study among people of Kerala found Type IV (reticular) pattern to be the most predominant pattern in the middle portion of upper lip.<sup>5</sup> Tsuchihashi Y et found type III pattern as the most predominant pattern in their study population (31.3% males and 33.3% females) followed by Type I, Type II, Type IV then Type V pattern.<sup>6</sup> In our study Type III found in 22% male and 24% female students. TR Saraswathi in their study found that both among males and females the most common lip print pattern was the intersected type while the least common was the reticular pattern.<sup>7</sup> Vahanwalla and Parekh in Mumbai found type I pattern in lips of female, similar to our study.<sup>8</sup> In our study, Type V pattern seen among 12% females studied. This was in not contrast to study done by Rachana V Prabhu, among Goan population, where Type V pattern was most predominant pattern.<sup>9</sup> Sivapathasundharam et al studied the lip prints of Indo-Dravidian population and noted that Type III pattern was predominant.<sup>10</sup> Our finding was not similar to any other studies. Various studies have shown that the lip print patterns formed revealed a population wise dominance that is a particular population is showing predominance of a particular lip print type. This is potentially useful tool for

identification. One common problem that is encountered during the cheiloscopy study is that of smudging or spoiling of lip prints leading to unidentifiable marks.<sup>11</sup> But in our study, none of the impression was spoiled. The use of lip prints is not limited to visible traces left at a scene of crime. Latent or invisible prints can be developed or made visible in a manner similar to that used for fingerprints. Ball stated that latent lip prints would be available at all crime scenes as the vermilion borders of lips have minor salivary glands and sebaceous glands with latter being principally present around edges of the lip associated with hair follicles, sweat glands in between, and secreting oils. It is these secretions and continual moisturizing by the tongue due to occasional sebaceous glands present on the lip, there are chances for the presence of the latent lip prints on items such as glass.<sup>12</sup> Lip prints can be obtained up to 30 days after being produced.

#### **Conclusion-**

Lip print shows population wise predominance. It can be used as an additional tool for identification and sex determination. Research studies and information regarding the use of lip prints as evidence in personal identification and criminal investigation in forensic dentistry are very scanty. Studying in depth and establishing further facts and truth in lip prints will certainly help as useful evidence in forensic dentistry.

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