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A study on the lip print pattern of Naga tribes

Magdalene Kiewhuo, R. Nandakumar*

Department of Zoology, St. Joseph University, Ikishe Model Village, Dimapur, Nagaland, India

*E-mail address: drnkzoo@gmail.com

ABSTRACT

Cheiloscopy is a forensic investigation technique that deals with the identification based on lip traces. Based upon the research, it was established that the arrangement of lines on the red part of human lips is unique for each human being. The present study is an attempt to determine the pattern of lip prints and evaluate its uniqueness in a sample of Naga population and also their association with print in the four quadrants of the lip. A total of 100 (15-40) years individuals were randomly selected. With the help of brush a layer of lipstick was applied on the lips of the subject. Following the basis of Tsuchihashi's classification the lip prints collected were studied. It was found that Type I' pattern was predominant among the studied subjects followed by Type I and Type III pattern while Type V pattern was the least frequent Lip pattern distribution in (all four quadrants) in both males and females of Nagas. It is found that no two or more persons had similar features of lip grooves. The frequency of repetition of the lip print pattern in successive quadrant is found to be high. Lip print pattern can be used as an additional tool for personal identification.

Keywords: Cheiloscopy, Nagas, Lip prints, identification

1. INTRODUCTION

Personal identification is essential for unknown deceased persons in homicide, suicide and accidents. The traditional methods of personal identification include odontology, sex determination, age estimation and differentiation by blood groups, DNA and fingerprints (Tsuchihashi, 1974). Cheiloscopy (from the Greek word cheilos which means lips) is the forensic investigation technique that deals with identification of humans based on lip traces. Lip prints are the normal lines and furrows in the form of wrinkles and grooves present in the

zone of transition of the human lip between the inner labial mucosa and outer skin, the study of which is known as Cheiloscopy. Caldas forensic identification, the mouth allows for so many possibilities. Dental surgeon has an active role in various objectives of forensic dentistry like age and sex determination, personal identification of unknown deceased person, analyzing bite marks as evidence, participating in mass disaster, giving evidence in child abuse etc. Collection of information from bite marks, lip prints and teeth in crime scene such as murder and rape can play a major role in criminal investigations.

The biological phenomenon of systems of furrows on the red part of human lips was first noted by anthropologist Fischer, 1902. The theory of uniqueness is a strong point used in the analysis of fingerprints and bite marks to convince the court of in the same way even lip prints and palatal rugae patterns are considered to be unique to an individual and hence hold the potential for personal identification.

They can be recorded and used as evidence in personal identification and criminal investigation. Like fingerprints, they can also be classified as per Suzuki's classification system and identified. They remain same throughout life and are uninfluenced by environmental changes, diseases and trauma. Lip prints could also contribute in evidence seeking process of forensic study. The lipstick marks left over certain objects are characterized by their permanence and persistence.

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

- Type I: Clear-cut vertical grooves that run across the entire lips
- Type II: Similar to type I, but do not cover the entire lip
- Type II: Branched grooves (Branched Y-shaped pattern)
- Type III: Criss-cross pattern, reticular grooves
- Type IV: Reticular, typical checkered pattern, and fence like
- Type V: Undetermined.

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 Naga population.

So, the purpose of this study was to document common lip patterns among Nagas and evaluate their uniqueness in population through the quadrant wise.

2. MATERIALS AND METHODS

The study was conducted on randomly selected 100 (10 male, 90 female) of ages between 15 to 40 people from Kohima and Dimapur districts, during December to January 2019-2020. Individual with a known hypersensitivity to lip sticks, with any inflammation of lips, malformation, surgical scars, deformity and lip lesions were excluded from the study. Materials used include mainly dark colored lipstick, bond paper, cellophane tape (two inch wide), a brush for applying the lipstick and a magnifying lens. Complete lip area is divided into four quadrants in clockwise direction namely, quadrant I, quadrant II, quadrant III and quadrant IV. The pattern of lip prints and their combinations were observed and noted in coded form, keeping in account the name and sex of the respective individuals.

2. 1. Technique

The lips of the individuals were cleaned and dark colored lipsticks were applied on the lips. The subject was to make a lip impression in the normal rest position of the lips by dabbing them against cellophane tape and then pressing it uniformly toward the corners of the lips. While studying the various types of lip prints, each individual's lips were divided into four compartments, i.e. two compartments on each lip, and were allotted the quadrants 1-4 in a clock-wise sequence starting from the subject's upper right as per Zsigmondy Palmer system of dental charting.

3. RESULTS

Lip print impressions were obtained from both male and female subjects and were classified in accordance of Suzuki Tsuchihashi's classification. It was found that Type I' pattern was dominant among the studied subjects followed by Type I and Type III pattern while Type V pattern was least frequent. Lip pattern distribution in (all four quadrants) males and females of Nagas showed that in both sexes Type I' was the most dominant lip print pattern (**Table 1**).

The distribution of lip print patterns in males and females in each quadrant were compared (**Figure 1**). In Quadrant-1 and 2 Type III pattern was dominant in both male and females. In Quadrant III and IV, Type I' pattern was dominant in male and in female type I was dominant (Table 1).

Table 1. Frequency of lip print pattern among subjects

Type	RUQ	LUQ	LLQ	RLQ	Total	Percentage
Type I	4	4	42	44	94	23.5
Type I'	11	12	36	38	97	24.25
Type II	25	25	7	8	65	16.25
Type III	35	32	3	2	72	18
Type IV	26	26	8	7	67	16.75
Type V	2	2	0	1	5	1.25

Note: RUQ - Right Upper Quadrant, LUQ - Left Upper Quadrant, LLQ - Left lower Quadrant, RLQ - Right Lower Quadrant

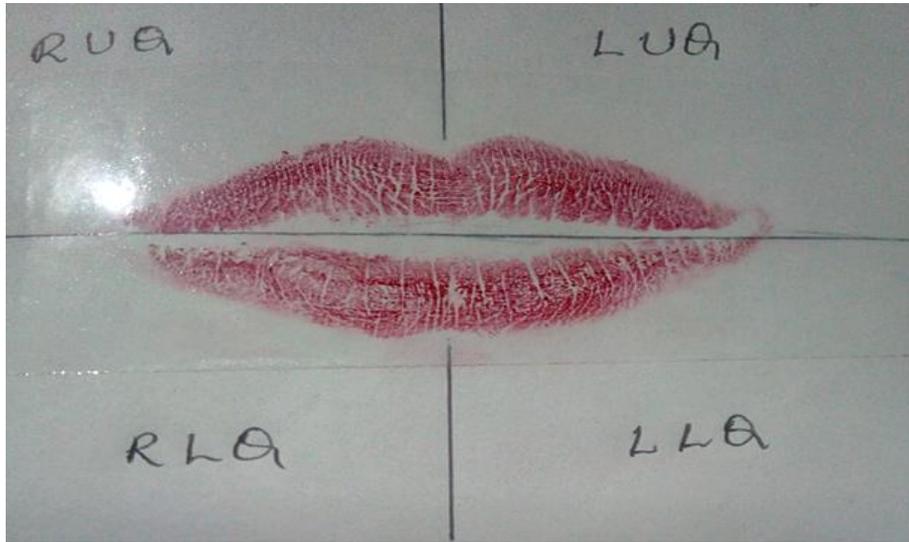


Fig. 1. Division of lip into four quadrants

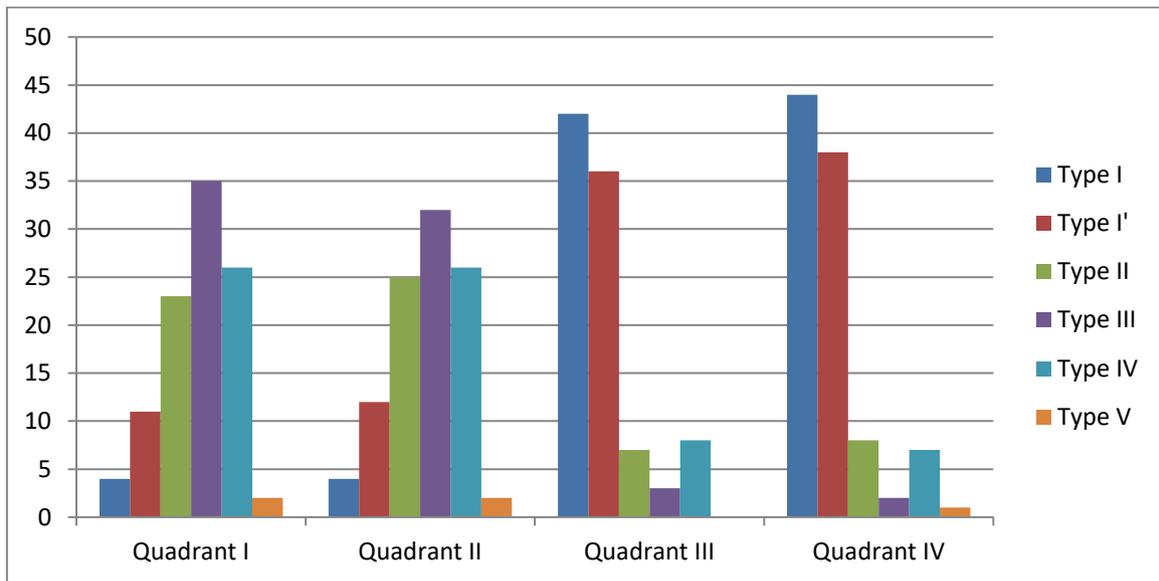


Figure 2. Distribution of lip print pattern in four quadrants



Figure 3. Tsuchihashi's Type I

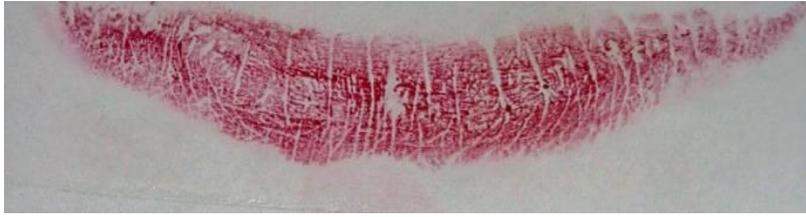


Figure 4. Tsuchihashi's Type I'



Figure 5. Tsuchihashi's Type II



Figure 6. Tsuchihashi's Type III

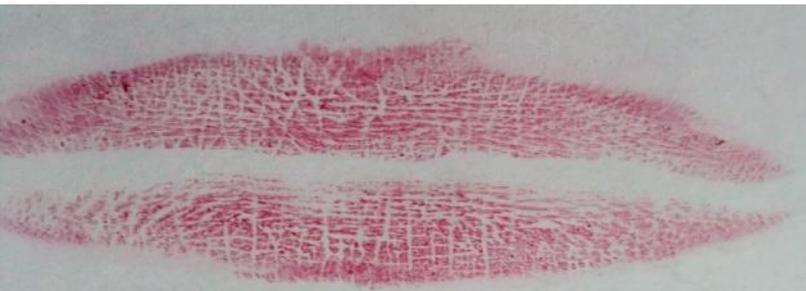


Figure 7. Tsuchihashi's Type IV



Figure 8. Type V Lip Print Pattern

Frequency of repetition of lip print patterns in different quadrants in relation to gender was compared among male and female subjects (**Figure 2**). It was found that frequency for two quadrants with same lip print pattern showed higher frequency in both male and female subject's while no quadrants with repetition for lip patterns were lower with among both.

First Quadrant: The predominant lip pattern found in the first quadrant is type III pattern (35) followed by type II and IV whereas type V is the lowest (**Figs. 3-8**).

Second Quadrant: Type III pattern was the most common in second Quadrant followed by type IV (26) and II (25) and the least common type in second quadrant is type I (2) and type IV (2).

Third Quadrant: Type I (42) pattern was the most common in third Quadrant followed by type I' (36) and IV (8) and the least common type in the third quadrant is type III (3). There is no type four pattern found in third quadrant.

Fourth Quadrant: Type I (44) pattern was the predominant pattern in fourth Quadrant followed by type I' (26) and II (25) and the least common type in fourth quadrant is type III (2) and type V (1).

4. DISCUSSION

With the increase in Crimes, it 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.

In the present study Type I' lip print pattern was common in all the quadrant of males and females except right and left upper quadrant in female where Type II pattern was predominant. 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 lower left and right quadrants Except in upper quadrants where it is very low.

Manypady compared Indian and Chinese individuals and found that the incidence of Type II pattern was highest among Indians. In our studied Naga population, we found Type I' as the most predominant pattern in both the lower quadrants followed by Type I, Type III, Type IV,

Type II 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.

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 cheiloscropy study is that of smudging or spoiling of lip prints leading to unidentifiable marks. 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. Lip prints can be obtained up to 30 days after being produced.

5. CONCLUSION

Lip print shows population wise predominance. It can be used as an additional tool for identification. 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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