

CHEILOSCOPY – Lip Print, An Determination of Sex and Individual.

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Abstract:

Aim: The aim of this study is to establish the uniqueness of lip prints which aids in personal identification and sex determination and to ascertain whether there is any hereditary pattern in lip prints among families with siblings and twins

Objective: The objective of the study was to check for any peculiar lip patterns in relation to the sex of the individual and determine the most common lip patterns.

Materials and methods: Dark coloured lip sticks, thin bond paper, glass slab and magnifying lens(10x).

Background: Cheiloscopsy is a forensic investigation technique that deals with identification of humans based on lips traces. The wrinkles and grooves between the inner labial mucosa and outer skin (also known as the zone of transition of human lip) i.e on the external surface of lip called as sulci labiorum form a characteristic pattern called 'lip prints'. There are six different types of pattern of lines on the lip.

Reason: To know about different patterns in lip prints and the determination of sex of the individual using this lip print.

INTRODUCTION:

Cheiloscopy” derived from Greek word chelios-lips and skopein-see is the name given to the study of lip prints[1].Two Japanese scientists, Y. Tsuchihashi and T. Suzuki in the period 1968-71, established that the arrangement of lines on the red part of the human lip is individual and unique for each human being[2]. The grooves present on human lips (Sulci labiorum) are unique to each person and can be used to determine identity [3]. Lip prints are normal lines and fissures in the forms of wrinkles and grooves present in the zone of transition of human lip, between the inner labial mucosa and outer skin, examination of which is known as cheiloscopy. This is unique for individuals, as finger prints [4]. Cheiloscopic techniques have an equal value in relation to other types of forensic evidences for personal identification [5] and sex determination. In a crime scene investigation, lip prints can link a subject to a specific location if found on cloths or other subjects, such as glasses, cups or even cigarette butts[6]. Analysis of the lip prints left at the scene of crime, and their comparison with those of suspected person may be useful for identification[7]. Dental identification remains one of the most reliable and frequently applied methods of identification, predominantly by the comparison of antemortem and post-mortem records[8]. This bio-optical phenomenon was first noted by anthropologists, R.Fischer, who was the first to describe it in 1902[9-12].

MATERIALS AND METHODS:**Materials:**

1. A dark coloured frosted lipstick
2. Thin bond paper
3. Cellophane tape
4. Magnifying lens (10X)
5. Pen / pencil for labelling the individuals details

Methods:

This study was conducted on 100 subjects, which includes 76 females and 24 males, in all age groups. Care was taken to select individuals having no lesion, whether active or passive on the lips. Individuals with hypersensitivity to lip stick were not included in the study. The lipstick was applied by the research personnel with a single stroke, evenly on the vermilion border. The subject was asked to rub both the lips to spread the applied lip stick. After two minutes, the lip impression was made on the strip of cellophane tape which was then stuck to white thin bond paper which served as the permanent record. The impression was then viewed under a magnifying glass of 10X . In this study we followed the classification for to determine the sex of the individual and also for the personal identification.

For sex determination :

In this study, we followed the classification of patterns of lines on lips given by Tsuchihashi [11].

Type 1A - vertical grooves run along the entire lips

Type 1B - vertical grooves that do not run along the entire lips

Type 2 - branched grooves (Y shaped)

Type 3 - Intersected grooves

Type 4 - reticulate grooves

Type 5 - undetermined grooves

For personal identification :

Each lip print was measured for its length and divided into four equal parts .

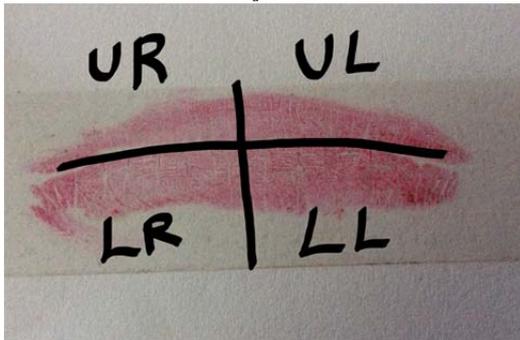
Four quadrant in a lip print ,

Upper lip right Upper lip left

Lower lip right Lower lip left

Total numbers of horizontal lines, vertical lines, partial vertical lines, Y shaped pattern, intersected pattern, number of boxes and undetermined pattern were counted by using 10X magnifying glass in each part of every print of all 100 subjects and data tabulated for

every subject. To avoid bias, all the lip prints were compiled, analyzed and interpreted by two examiners to determine the sex and identity of the individual.



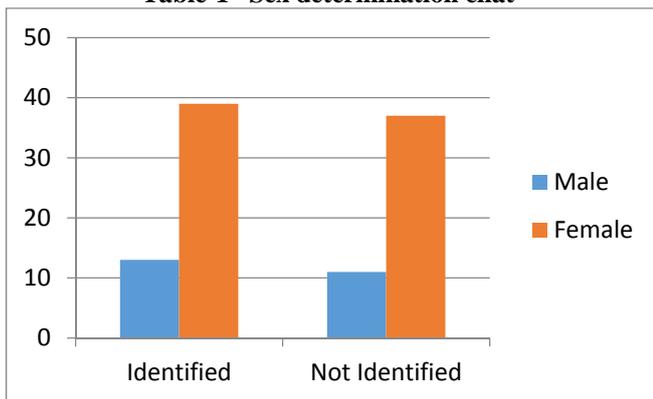
RESULT:

Our study revealed the following observation.

1. Every lip print is different and unique.
 2. No two lip prints were matched with each other.
- And therefore no hereditary pattern in the lip print.

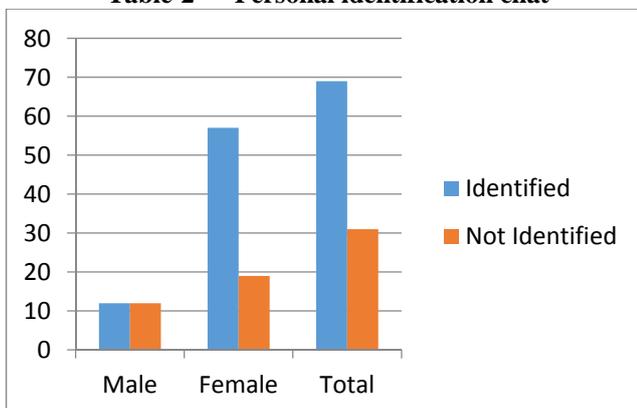
Out of 100 subjects which includes 76 females and 24 males a total number of 39 females and 13 males were correctly recognized on the basis of their lip prints. Perfect correlation between the sex determination for male and female. **Table-1**

Table-1 Sex determination chat



Out of 100 subjects 79 subjects were correctly identified which include 67 females and 12 males. It indicates there is perfect correlation between person's identification among males and females. **Table-2**

Table-2 Personal identification chat



The most predominant lip print in the upper right lip is type 1a which is present predominantly in females. Type 5 is absent in both males and females and the least is type 4 which is predominant only in males. **Table-3,4**.

Table-3

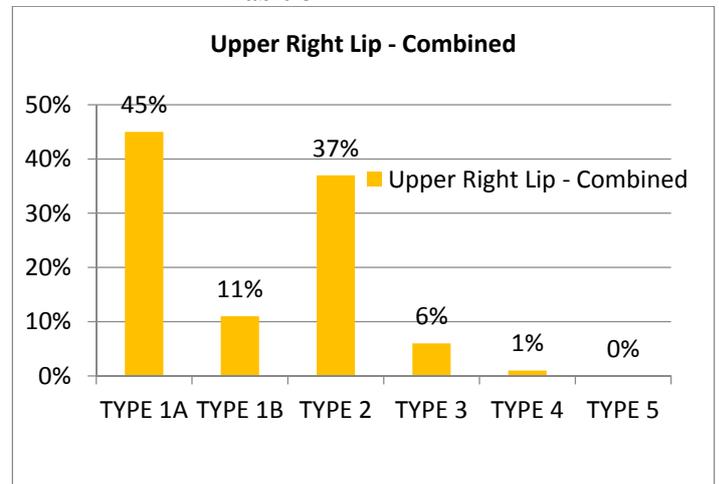
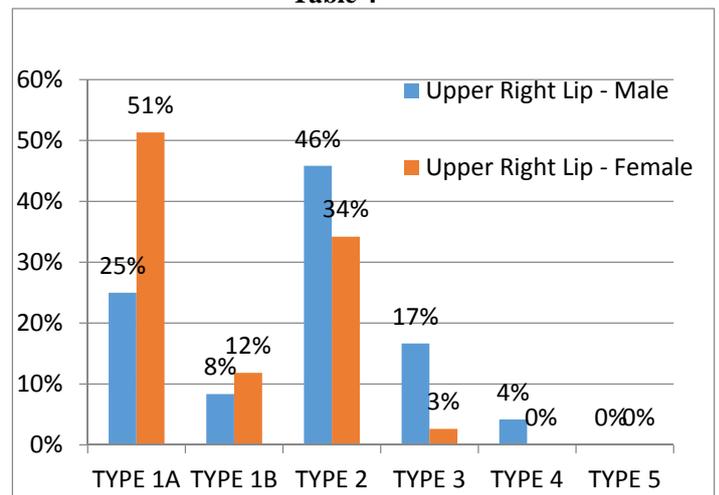


Table 4



The most predominant lip print in the upper left lip is type 2 which is present predominantly in males. The least is type 5 which is predominantly in females. **Table-5,6**

Table-5

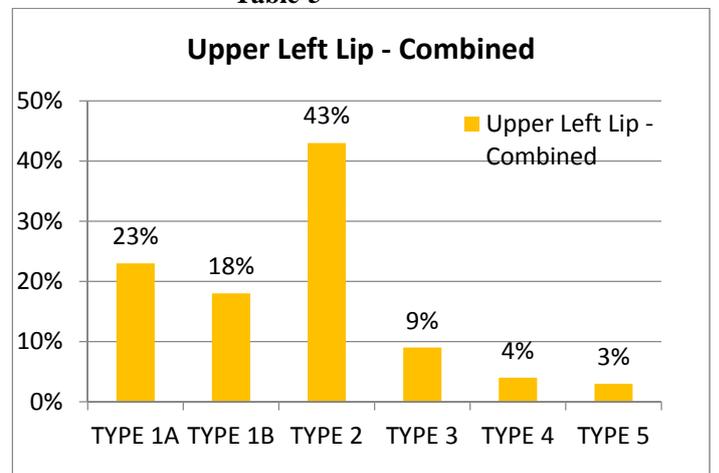
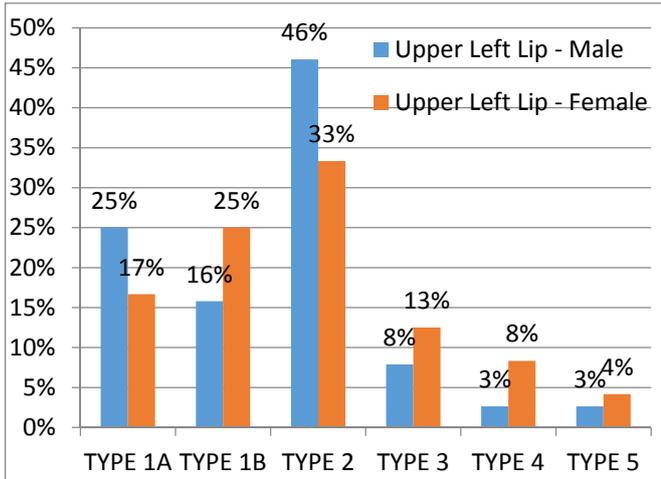


Table-6



The most predominant lip print in the lower right lip is type 1a which is present predominantly in males. Type 3 is absent in both males and females. Type 4 is present in males and type 5 is present in females. **Table-7,8**

Table-7

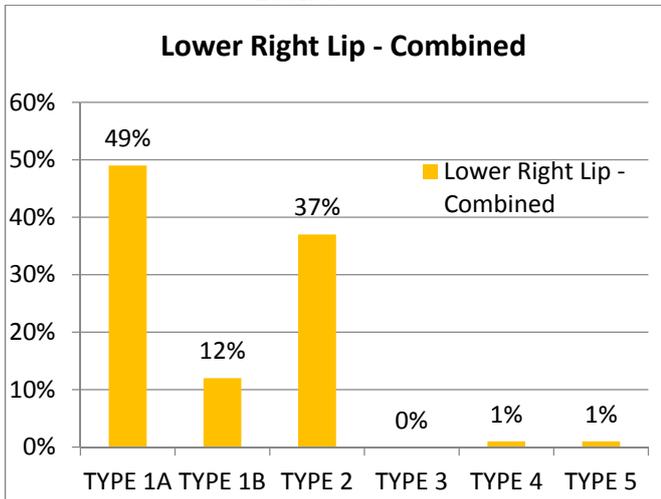
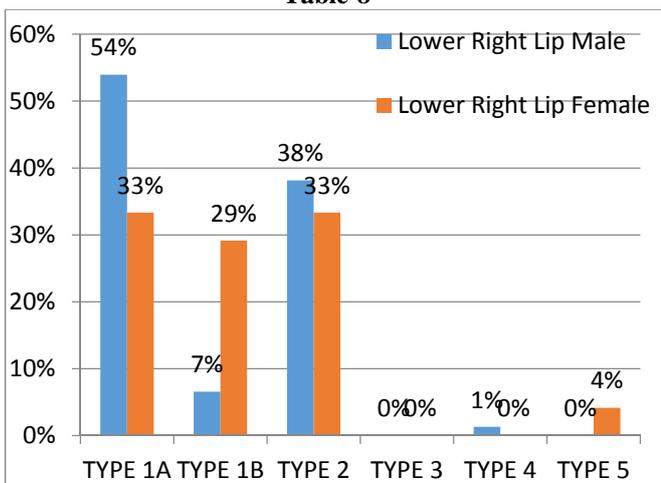


Table-8



The most predominant lip print in the lower left lip is type 2 which is present predominantly in females. The least is type 3 which is present predominantly in females. **Table-9,10**

Table-9

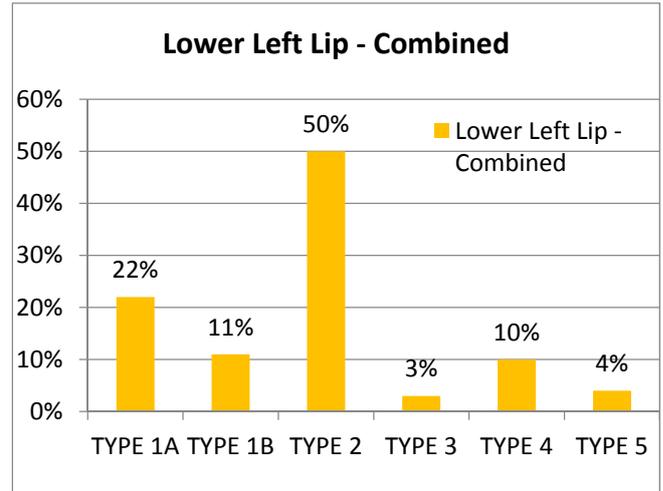
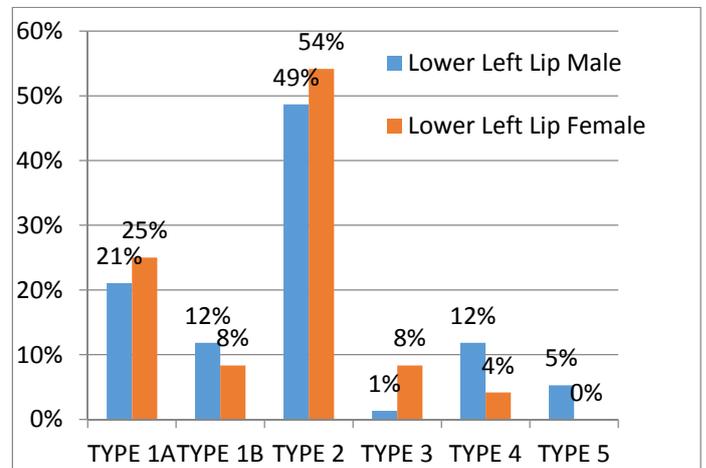
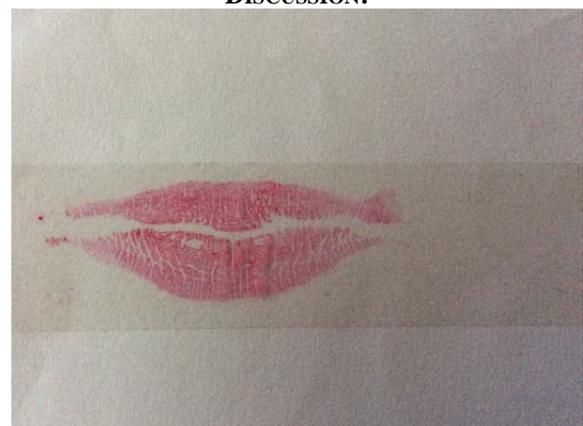


Table-10



DISCUSSION:



Personal identification is necessary for unknown deceased person in homicide, suicide, accident, mass disaster, etc., and for living individual who are missing or culprits hiding their identity. If a definite description of the different parts of the upper lip and the lower lip are established for an individual by detailed study, this anti-mortem record can be used for matching the details of lip prints in postmortem records for personal identification[4].

Like finger prints lip prints are unique and individual characteristics. The use of lip prints for criminal case identification is limited because the credibility of lip prints has not been firmly established in our courts. Found in surfaces like glass, coffee cup, etc.

Identifiable as early as 6th week of intrauterine life. They are permanent, unchangeable even after death, and unique to each person except in monozygotic twins. The pattern change very rarely in the life time. Does not change significantly post dead cadaveric lip prints are considered satisfactory for identification purposes. The major problem in lip print analysis is smudging and we can overcome this problem by using a good quality lip stick. Lip print pattern can be of five types based on the Tsuchihashi's classification. A lip print at the scene of crime can be a basis for conclusions as to the character of the event, the number of people involved, sexes, cosmetics used, habits, occupational traits and the pathological changes of lips [13]. The F.B.I. and the Illinois State Police consider that lip prints are unique like fingerprints and are a positive means of identification [14,15].

In the present study, we aimed to find out the variations in lip patterns of 40 individuals. We tried to ascertain whether the lip prints hold the potential for determination of sex and identity of the individual. In our research a dark coloured lip stick was used and a single coat was applied evenly. And a broad cellophane tape was used to take the impression by sticking a small strip of cellophane tape in the lips of the subject and gently peeling it off their lips so that the subject is not hurt by this method. A thin coat of lip stick can be applied to avoid smudging. The peeled cellophane tape is stuck in a white sheet.

In the past some researchers have worked on lip prints to prove that the gender difference does exist in lip print. Like in past Girish R Dongarwar [16] has proved that cheiloscopy helps in sex determination and personal identification. In the same way our present study also proved that cheiloscopy holds the potential to identify sex and also in personal identification.

CONCLUSION :

It concludes by enlightening the readers with the fact that the possibilities to use the red part of lips to identify a human being are wider than it is commonly thought. Our study has proved that cheiloscopy has the potential to identify the sex and identity of the individual, as they remain stable over time and unique to individual, even in twins and family relatives. Further studies concerning standardisation of the pressure applied to lip print during recording the prints is recommended and development for biometric system to allow fast and accurate assessment of lip print patterns.

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