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CHEILOSCOPY;
A TOOL FOR SEX DETERMINATION

1. Head;
Forensic Medicine and Toxicology Department; SKZMDC, Lahore.
2. Associate Professor Pediatrics; Children Hospital, Lahore.
3. Professor and Head; Forensic Medicine and Toxicology; Lahore University.
4. Demonstrator; Forensic Medicine and Toxicology Department; SKZMC, Lahore.
5. Associate Professor; Forensic Medicine; KEMU

Corresponding address:
Dr. Nasreen Ishaq,
Assistant Professor and Head
Forensic Medicine and Toxicology
SKZMDC.
nasreenehsan@yahoo.com

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Dr. Nasreen Ishaq[1], Dr. Ehsan Ullah[2], Dr. Imran Jawaad[3], Dr. Ali Ikram[4], Dr. Arif Rasheed[5]

ABSTRACT… Introduction: Identification of human being is always a problem for scientists and is based upon scientific principles. Finger prints, dental data, anthropometry & DNA analysis are the tools used for identification purposes. The new arriving tool in the field of personal identity is cheiloscopy i.e. study of lip prints which are unique for every individual and behold the potential for identification purpose. If lip prints are found at scene of crime, the presence or absence of a person can be ruled out from the scene of crime. **Methodology:** The present study comprises of 150 students of SKZMDC in the age group of 20-23 year out of which 50 are males and 100 females. Lip prints were collected and matched according to Suzuki &Tsushihashi's classification. **Results:** The most common pattern found in female was II, while type III was predominant among males. **Conclusion:** Studies show lip prints have great potential to establish individuality, show gender variation and remain unchanged forever.

Key words: Cheiloscopy, Anthropometry.

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INTRODUCTION

The identification of human remains plays a very important role that spans not only criminological investigation, but also the certification of death.

In addition to finger prints analysis, postmortem reports, DNA finger printing, lip prints can be instrumental in identifying a person positively. This method can be used to verify the presence or absence of a person at the scene of crime[1]. The wrinkles and grooves on labial mucosa, called as sulci labiorum, forms the characteristic pattern that are studied while examining lip prints ;the study of which is referred to as cheiloscopy. This pattern is as unique to an individual just like the fingerprints[2].

Although traces of lips are typically found on cutlery, crockery items and cigarette ends, they can alsoin atypical places, such as on the surface of windows, paintings, doors and plastic bags[3]. They frequently appear in the scene of murders, rapes, and burglaries. Traces with clear lines and individual elements enable individual identification of a human being. In a sense, lip prints have the same value as dactyloscopic traces[4].

Cheiloscopy has a long history. First described by the anthropologist Fischer,[5] lip prints were first recommended as a tool for identification as early as 1932 by Edmond Locard (1877-1966), one of France's greatest criminologists[3]. Its use as a method of identification was described in textbooks on homicide investigation by 1950[6]. Lip prints were classified into different groups by 1970[7].

These are classified into six types (Table I) (Figure 1)

Type	Characteristic
Type I	Vertical comprising of complete (end to end) longitudinal fissures/patterns
Type I'	Incomplete longitudinal fissures
Type II	Branching Y shaped pattern
Type III	Criss-cross pattern
Type IV	Reticular, fence like
Type V	Undetermined

Table-I.

In 1971 the dissimilarities of kiss marks in relation to a suspected case of theft was studied. By 1999 lip prints were generally accepted within the forensic science community as means of

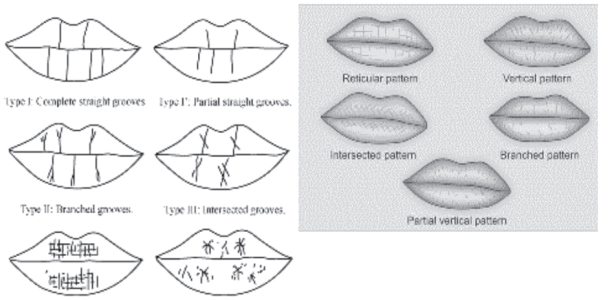

Figure-1. Various lip patterns[7]

identification, scientific comparison and were considered unique like finger prints as a positive means of identification. In the past it was also proved that gender difference exist in lip print i.e. type-I and type-II, were the dominant female pattern while type-III and type-IV were prominent in male[8]. Another study showed that females have same pattern in all four quadrants of the lips while males have different pattern in the same individual[9].

No study has been conducted thus-far about the sensitivity of cheiloscopy in identifying the sex of the individual based solely on lip prints. Keeping in view the above facts and brief description, the present study is planned to be conducted for identifying the different lip patterns and their distribution in male and females with the following aims and objectives.

AIMS AND OBJECTIVES

1. To ASCERTAIN whether lip prints have the potential for determination of sex of an individual from the configuration.
2. To IDENTIFY the most common pattern

MATERIAL & METHODS

STUDY DESIGN

Cross-sectional / descriptive

PLACE OF STUDY

The Forensic Medicine Department at SKZMC, Lahore.

SAMPLE SIZE

50 males and 100 females studying in the 3rd year and 4th year MBBS classes at SKZMC.

SAMPLING TECHNIQUE

Systematic sampling procedure was adopted.

SAMPLE SELECTION

Inclusion criteria

Male and female student between 18 to 25 years of age

Exclusion criteria

- Sensitivity to lipstick.
- Presence of inflammatory lip disease.
- Evidence of trauma to the lips.
- Malformation, deformity & scarring over lips.

DATA COLLECTION PROCEDURE

This study was planned to be carried out in the department of Forensic Medicine and Toxicology SKZDMC Lahore, the study population was 100 female and 50 males student of MBBS third year and fourth year in the year 2013.

All the participants were briefed about the purpose of study and written informed consent was taken on a consent form. The participants were between 18-25 years of age. Lip prints were taken on bond paper by applying dark color lipstick with the help of lip brush. The person was asked to rub both the lips to spread the applied lipstick evenly and the imprints obtained were encoded according the name and sex of the individuals.

There was one person taking the lip prints of the population and a second person studying the pattern and group according to the given classification. The second person who was analyzing the patterns was blinded to the gender of the participant.

DATA ANALYSIS PROCEDURE

Data is entered in SPSS version 17. Proportions and percentages are calculated for categorical data (quantitative data e.g. gender and lip prints categories). As this is a descriptive study, frequencies and percentage are calculated.

RESULTS

This study was conducted on 150 subjects, included 50 males and 100 females students of

MBBS, in the age group of 18-25 years. Results obtained after the analysis of all lip prints are presented in table II, and graphically shown in Figure 2

Types	Male		Female		Total	
	Number	%age	Number	%age	Number	%age
I	3	6%	70	70%	73	48.67
I	2	4%	15	15%	17	11.33
II	3	6%	8	8%	11	7.33
III	35	70%	1	1%	36	24.00
IV	5	10%	5	5%	10	6.67
V	2	4%	1	1%	3	2.00
Total	50	100%	100	100%	150	100%

Table-II. Patterns lip prints in male and female students

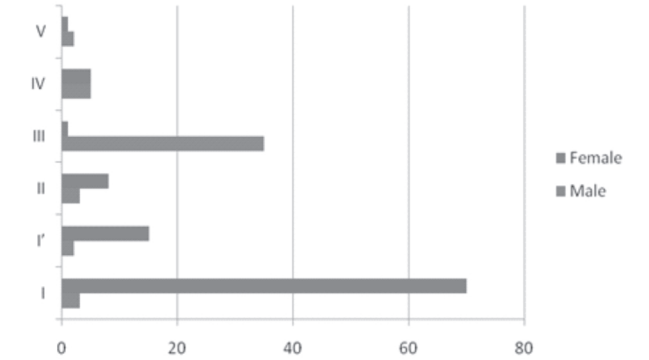

Figure 2. Bar Chart of Frequencies based on gender and type of lip prints

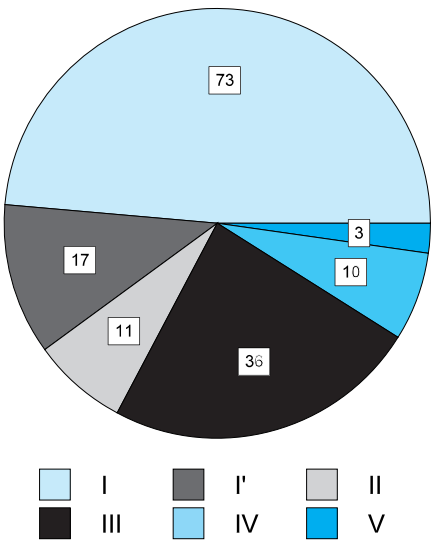

Fig-3. Pie chart of lip pattern among study population

as the most common pattern. This was followed, in order, by Types III (24%), I' (11.3%) and II (7.3%). In males, Type III (70%) lip pattern was predominantly reported which is same as stated in Gondivkar study but different from Sharma which shows type IV as predominant pattern followed by type III (10%) type II(6%) whereas Type I (70%) lip pattern was commonly found in females followed by type I (15%). It is same as found in Sharma study but different from Gondivkar which shows type II as the most common pattern among females. Another study[12] found that the reticular pattern (Type IV) was the most common. This contrasts with Augustine et al., who found that the lip prints varied equally between males and females and varied among different age groups[13].

This variation indicates that patterns of lip prints may vary along a geographic distribution, and is something that needs further exploration.

According to Kautilya et al., lip print patterns are an effective method of determining the gender of an individual, especially when the prints are corroborated with the diameter of the lips[14].
Human identification is a mainstay of civilization and the identification of unknown individuals has always been of paramount importance to society[11]Identification of any individual - living or dead is based on the theory that all individuals are unique. When an unidentified body or a trace is found it is assumed that it could be anybody. By classifying the individuals into groups (e.g. age, sex, race, height), the identification possibilities are narrowed. The more unique the characteristic,

the smaller the group becomes[15].
A series of forensic odontological studies on the morphology of the lips and the pattern produced when they are impressed onto a variety of surfaces forms a worthy additional weapon for personal identification. The red part of the lips together with an individual structure of lines may constitute a source of circumstantial evidence.

This study was carried out to classify and study the common lip-patterns and their variations in the study population. The lips which were studied were only those which had no inflammatory disease, trauma, malformation, deformity or scars. However, these abnormalities themselves are identification marks. It is difficult to decide the pattern of the lip prints when inflammation is present in the lip. It has been observed that, after healing, the lip reassumes its own pattern in the healthy condition; this fact in itself indicates the permanence of the lip prints.

The classification of the lip-prints is valuable in reducing the number of items to be compared, and the discernment of identity should be made, as in the case of fingerprints, by finding characteristic points to establish the diagnosis. One must also consider the possibility of post-mortem changes of lip prints from cadavers with various causes of death. Utsuno et al[16] have studied these changes and concluded that a satisfactory identification rate could be achieved.

Evidences such as photographs, cigarette butts, drinking glasses, cups, letters, window panes and other items that could bear lip prints should be closely examined. A trace of this kind carries a huge amount of information which can be used in the reconstruction of the events, establishing versions, checking them and identifying suspects. A lip print at the scene of crime can be basis for conclusion as to the character of the event, the number and sex of the people involved, cosmetics used, habits, occupational trials and the pathological changes of the lips themselves.

CONCLUSIONS

Despite the fact that identification of an individual by lip prints appears to be accepted in some places, this procedure requires further studies with larger sample size. The uniqueness of lip prints need to be confirmed and accepted. A standard and uniform procedure has to be developed for the collection, development and recording of lip prints and the ensuing comparison. Until then, identification by lip prints will not stand up to rigorous interrogation in court.

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