Cheiloscopy for Sex Determination among Individuals Aged 17-25 Years.

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Abstract

Background:
External surface of the lip has many elevations and depressions forming a characteristic pattern called lip prints, examination of which is referred to as CHEILOSCOPY.
The lip prints being uniform throughout the life and characteristics of person can be used to identify an individual. The present study was aimed to study lip print patterns between two genders.
Objective:
The objective of the study was to check for prevalence of lip print pattern and their variation between gender in 17-22 yrs old individuals.
Materials and method:
The study was conducted on 200 individuals (100-males, 100-females) aged 17-25yrs by applying an even coat of lipstick and obtaining the lip print on a paper or cellophane tape.
The lip prints were then studied and analysed to check for the prevalence of lip print pattern and their variation between gender in 17-25 yrs old individuals.
Results:
Among 100 male subjects, branched groove(14.5%) was seen mostly while in the females there was presence of vertical groove(14%).

INTRODUCTION

Human identification is one of the most challenging subjects that man has been confronted with. Human identification is based on scientific principles, mainly involving dental records, fingerprints and DNA comparisons.(1,2)These serve as permanent records. The sophisticated molecular biology techniques are not always employed due to their expenses and lack of availability. Hence in those situations easier but reliable methods like lip prints can be employed.

Lips are two highly sensitive mobile folds, composed of skin, muscles, glands and mucous membrane. They surround the oral orifice and form the anterior boundary of the oral cavity.(3) The wrinkles and grooves on the labial mucosa (called sulci labiorum) form a characteristic pattern called "lip prints," the study of which is known as cheiloscopy.(4,5) Fischer was the first to describe it in 1902.(6) Use of lip prints for personal identification was first recommended in France by Locard.(7) In 1950, Synder also suggested the idea of using lip prints for identification.(8) Lip prints are considered unique to an individual and analogous to fingerprints.(9)

The present study was aimed to study the lip prints of different individuals and find out the incidence of any particular pattern in the given age group in relation to specific gender.

MATERIALS AND METHODS

Sample selection:
A total of 200 subjects, 100 males and 100 females who were randomly selected were included in the study. The subjects included in the study were ranging in age group between 17-25 years. The study was approved by the institutional review board.

Inclusion criteria:
1. Subjects willing to participate.
2. Subjects between the age group of 17-25 years.
3. Subjects free from scars or lesions on the lips.

Exclusion criteria:
1. Subjects not willing to participate.
2. Subjects with deformities of lips like cleft lip, ulcers, traumatic injury, inflammation or orthodontic treatment.
3. Subjects allergic to the lipstick used.

Methodology:
In the present study, we aimed to find out the variations in lip print patterns of 200 individuals. We tried to ascertain whether the lip prints hold the potential for determination of sex of the individual from their configuration. Even though the lines and furrows are present, both in upper and lower lip from one corner of mouth to the other corner, only the middle portion of the lip was taken into account.

A dark coloured lipstick was applied with a single stroke, evenly on the vermilion border. The subjects were asked to rub both the lips to evenly spread the applied lipstick. After about two minutes, a lip impression was made on a strip of cellophane tape on the glued portion, which was then stuck on to a white bond paper. This served as permanent record. The impression was subsequently visualised with the use of a magnifying lens. Immediately after recording the lip prints, they were examined on the first look. If the print was not satisfactory another print was obtained from the

same individual. The lip prints obtained were coded, while noting the age and sex of the respective individual.

The lip prints were interpreted based on the classification proposed by Suzuki and Tsuchihashi, in 1970, which is as follows: (10)

1. Type I – A clear cut groove running vertically across the lip.
2. Type I' – Partial-length groove of type I
3. Type II – A branched groove
4. Type III – An intersected groove
5. Type IV – A reticular pattern
6. Type V – Other patterns

The results were tabulated in excel spreadsheet and data analysed using SPSS software.

RESULT:

The present study was conducted to study the lip prints of different individuals and find out if there is association between any lip print pattern and gender of an individual. The samples were collected from 200 individuals which included 100 male and 100 female participants.
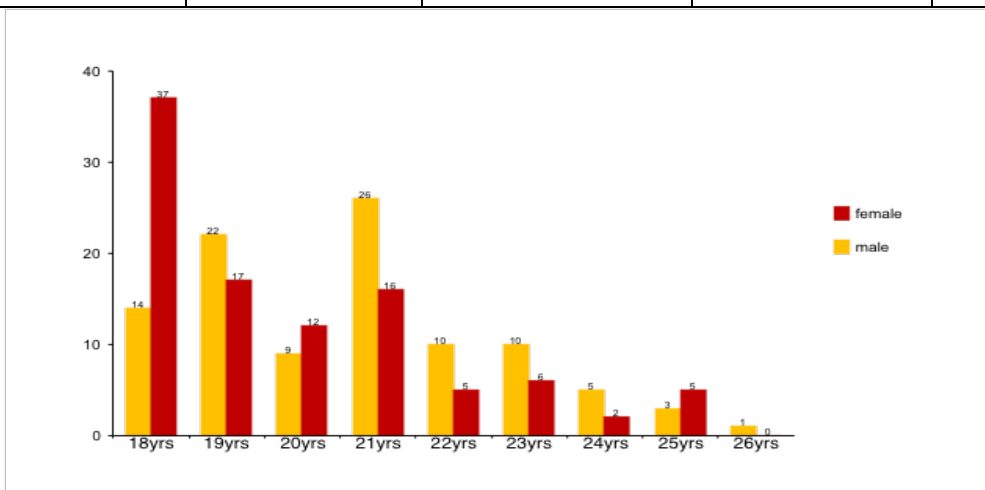
Among 100 male subjects, vertical groove was seen in 7%(14), branched groove in 14.5%(29), intersected groove in 12.5%(25), reticular groove in 10%(20) and undetermined in 6%(12) individuals.

Among 100 female subjects, vertical groove was seen in 14%(28), branched groove in 13%(26), intersected groove in 9%(18), reticular groove in 7%(14) and undetermined in 7%(14) individuals.
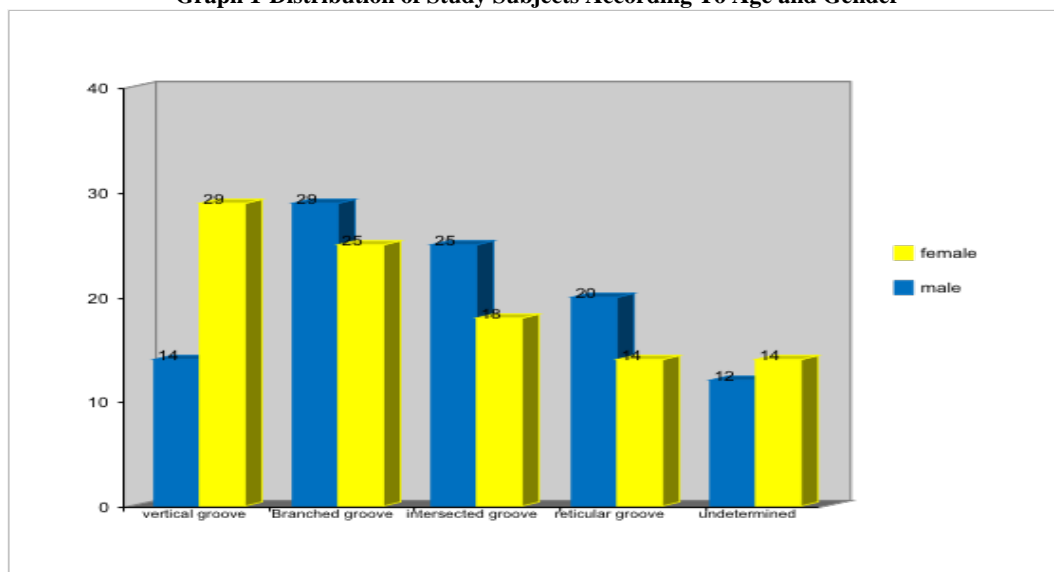
It was evident from the study that there exists no significant difference among lip prints between males and females.

Table 1- Showing the Distribution of Lip Prints among the Two Genders.

	Vertical groove	Branched groove	Intersected groove	Reticular groove	Undetermined
Male	14	29	25	20	12
Female	28	26	18	14	14

Graph 1-Distribution of Study Subjects According To Age and Gender

Graph 2-Gender Distribution According To Types

Table 2-

lipprints * gender Crosstabulation

Count

		gender		Total
		male	female	
lipprints	vertical groove	14	29	43
	branched grove	29	25	54
	intersected groove	25	18	43
	reticular groove	20	14	34
	undetermined	12	14	26
Total		100	100	200

Table 3-

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.881[a]	4	.096
Likelihood Ratio	8.004	4	.091
Linear-by-Linear Association	2.232	1	.135
N of Valid Cases	200		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 13.00.

Figure 1-Vertical Groove Pattern

Figure 3- Intersected Groove Pattern

Figure 2- Branched Groove Pattern

Figure 4- Reticular Groove Pattern

Figure 5- Undetermined

DISCUSSION

Cheiloscopy- the study of lip prints plays an important role in forensics. Finger prints have always been used in identifying an individual from a crime scene and is an accepted evidence in the court of law. Though not exclusive like DNA of an individual, finger prints have the merits of being unique, permanent. These features are also shared by lip prints, Lip prints are unique and they are not identical even between identical twins or among members of the same family. It is unique, permanent and regenerates even after an injury. In certain circumstances, wherein these finger prints are not available, lip prints might act as valuable supportive evidence. In fact, the lip prints have played important role in convicting criminals in important cases. (16).

Ever since, lip prints have been studied much more in the Japanese population (13,14). Due to its usefulness in crime solving, it has been included as a source of evidence in the court of Law (6). Lip prints have been studied in terms of its stability, gender distribution in different groups of population. In order to extend its role further as a salient tool of identification, a database including various populations needs to be established. The pattern, trend and prevalence needs to be analysed, more so in a country like India with diverse inhabitants. The present study was one such contributory effort comparing the lip prints among male and females.

Cheiloscopy is applicable mostly in identifying the living, since lip prints are usually left at the crime scenes, and can provide a direct link to the suspect.(9) The secretion of oil and moisture from lips enable development of "latent" lip prints, analogous to latent fingerprints.(11,12) Lip prints can link a subject to a specific location if found on clothes or other objects, such as glasses, cups or even cigarette butts. It was only in 1930 that de Lille(1)developed studies which led to lip print use in criminology. Synder(8) in 1950 also mentioned the possible use of lip prints in the identification of individuals.

Suzuki and Tsuchihashi reported two cases were lip prints were proven to be useful in criminal identification. The first case lip prints were identified on envelope while in the second case they were noted on the undergarments. Also FBI in 1987 had successfully identified a male robber dressed in female disguise. These cases thus suggest that lip print study can be used for criminal identification. It is also proved that lip prints are as good as fingerprints in criminal identification when no other means of identification are available.

Although lip prints have been previously used in the Court of Law, their use is not consensual.

Our study was aimed to use lip print as a tool for sex determination among individuals aged 17-25 years.

In the present study, it was noticed that no two individuals or more than two individuals have similar type of lip prints. This observation was similar to the observations reported by many other workers.(6,10,13-20)

In the present study, the most common lip print in general is Type II (branched pattern) followed by Type I (vertical pattern; figure 1), Type III (intersected pattern; figure 3), type IV (reticular pattern; figure 4) and Type V (undetermined pattern; figure 5).

The most common lip print found in females examined in the present study were Type I(14%). Similarly Malik and Goel(21) and Kautiliya et al.,(22) also reported that Type I were the most common pattern in females. While I tha case of males the most common lip print examined in the present study was Type II(14.5) and Type III(12.5). This is in contrast to study done by Naik et al.,(23)and Arief et al.,(24) showed that Type IV was most prevalent in males. In the study conducted by Malik et al(21) Type IV and Type V patterns were most commonly seen. However studies conducted by Kautiliya et al.,(22) showed that the most common lip print seen in males was Type III. Due to ethnic and racial variations our findings are different from the findings that were listed above.

Further evidence and researches are needed to be done on large scale population so as to confirm their uniqueness and show their use in human identification.

CONCLUSION

Lip Prints play an important role in identifying an individual similar to finger prints. It is an evidence that is usually not looked for in a crime scene. However, it might prove to be a very useful tool in Identification of individual. Cheiloscopy and its study in varying avenues might provide valuable information with regards to identification of an Individual. Large studies involving a larger population, with varied ethnic origins might provide more meaningful information and add value to this useful tool of identity.

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