CORRELATION BETWEEN LIP PRINTS AND FINGER PRINTS IN SEX DETERMINATION

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ABSTRACT

Background*: Cheiloscopy and Dactyloscopyare forensic investigation techniques that deals with the identification based on lip traces and finger prints. Both are genetically determined to remain stable over periods of time. They are unique among each and every individual and help in identification through forensic investigation. They also create new room in sex determination.*

AIM&OBJECTIVE*: To determine the prevalence pattern of lip prints and finger prints and also to determine correlation of lip prints and finger prints in sex determination.*

MATERIALS AND METHODS*: The study consists of 25 males and 25 females taken randomly. Lip print was taken using pink/ red coloured lip stick and finger print using stamp pad and chart respectively. And they are viewed under magnifying lens*

RESULTS*: The present study showed predominantly Type 1and Type 3 lip print pattern. In males Type 1 was found to be predominant and in females Type 3. Loop type finger prints pattern predominance was noted in males and in females Loop type and Arch type finger prints pattern predominance was noted. The present study showed high correlation between lip print and finger print both males and females but was not statistically significant.*

KEY WORD*: Cheiloscopy, Dactyloscopy, lip prints, finger prints.*

INTRODUCTION:

Forensic science is one of the most challenging subjects that a man has confronted. (1). In the past decades Chieloscopy and Dactyloscopy drawed attention of many scientists as a new tool human identification in both civil and criminal cases. The first study of lip print was carried out during 1961 by Tshushihashihand based on the arrangement of the red part of lips in individuals (2). He named the study as 'sulcilaboriumrubronum'. The finger print pattern remain stable over the life times. These conquer the individual identification leading to the new path in forensic dentistry.

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The lip prints and the finger print do not change during the life time of the person. It has been verified that the lip prints recover after undergoing alternations like minor trauma, inflammation, and disease like herpes. The lip prints have normal lines and fissures present in the zone of transition and inner labial mucosa and outer lips.

The finger prints is an impression of friction ridges all parts of the finger and by far still proves more reliable and acceptable evidence till the date in court of law for personal identification. Friction ridges is usually recorded with the help of ink. (1)

The main aim of the study is to find a possible correlation between lip and finger prints in males and females and to determine the predominant patterns in males and females and to establish whether this correlation can help in identifying the sex.

MATERIALS AND METHODS:

The study comprises of 50 persons out of which 25 are males and 25 are females . The study participants were selected randomly. The present study was carried out in Saveetha Dental College, Chennai, India

Inclusion criteria for the study included all age groups except older age to overcome age related pathosis and there wass no gender restrictions.

Exclusion criteria included individual with lip scar, lip lesions, lip deformities and hyper sensitivity reactions to lip prints.

The print of lips and finger was taken in the rest position. The lip prints was taken using brown/ red coloured lip stick and the print was taken using the cellophane tape and struck in the chart paper. The imprint of right thumb was taken using ink stamp pad on an A4 paper and visualised using magnifying lens. Informed consent was obtained from all the participants. Lip prints and finger prints was analysed.

Lip prints were recorded based on the criteria by Tsuchihashi's classification (1970): (figure 4)

Type I- clear cut vertical grooves running across the lip

Type I'- straight grooves that disappear half way into the lip instead of covering entire width of the lips

Type II - grooves that fork/ branched into their course

Type III- an intersect groove

Type IV- a reticular groove

Type V- groove that do not fall into any of above mentioned categories

FINGER PRINTS were recorded based on Kuchen et al 2005 (figure 1, 2, 3)

1. Loop pattern
2. Arch pattern
3. Whorl pattern

Stastical analysis was done. Correlation of lip print and finger print in males and females were statistically analysed by using Pearson correlation technique. P value is taken <0.05.SPSS software was used for statistical analysis.

RESULTS:

Table 1 and figure 5 shows distribution of lip prints in males and females. Of all the male participants 36% showed Type 1, followed by 24% type 3 and the least being type 1' 0%. Of all the female participants 28% showed Type 3 followed by 24% type 4 and the least being Type 1' 0%. Overall the predominant lip print pattern was found to be both type 1 and type 3.

Table 2 and figure 6 shows distribution of finger prints in males and females. Of all the male participants 44% showed loop followed by 32% whorl and the least being arch 24%. Of all the female participants 40% showed both arch and loop and the least being Whorl 20%.

Table 3 and figure 7 shows correlation of lip prints and finger prints in males. Pearson correlation was done which showed high correlation of about 0.78

Table 4 and figure 8 shows correlation of lip prints and finger prints in females. Pearson correlation was done which showed a correlation of 0.66

Overall results of the present study showed predominantly Type 1and Type 3 lip print pattern. In males Type 1 was found to be predominant and in females Type 3. Loop type finger prints pattern predominance was noted in males and in females Loop type and Arch type finger prints pattern predominance was noted. The present study showed high correlation between lip print and finger print both males and females but was not statistically significant.

DISCUSSION:

Forensic dentistry contributes to the various personal identification in many methods such as bite marks analysis, dental material, palatal rugae pattern, jaw bone and molecular methods effectively.(3). Historically identification is one of the most the challenging subject that has confronted man. Forensic dentistry contributes to the personal

identification such as bite marks, jaw bone pattern and lip prints more effectively(4,5). Lysochromes are high useful components in identifying latent lip prints (6).

Our study revealed that Type 1 and 3 lip prints pattern was found predominantly in overall population of both males and females. This was in contradiction to other studies like Govindkar et al study which was conducted in Maharashtra showed that Type 2 pattern was found predominant.(5). Nagasupriya et al study which was conducted in bhimavaram in 2011 showed Type 2 pattern to be predominant. Kumar et al study in 2012 in pondy reaveled Type 2 pattern to be predominant. (4, 5, 6, 7, 8)

Our study revealed that Type 1 pattern of lip print is found predominantly in male and Type 3 pattern found predominantly in female. Shaileshet al study in 2009 identified that Type 3 pattern in females and type 2 pattern in males showed predominant in Maharashtra population (5). Nagasupriya et al study in 2009 identified type2 pattern predominance in both males and females of Bhimavaram population. Kumar et al found type 3 pattern in males and type 2 pattern in females predominant in Pondicherry population . Sandhu et al study showed Type 1 pattern predominance in both males and females of Punjab population. (4, 5, 6, 7, 8)

The overall correlation of lip prints and finger print pattern showed stronger correlation in males ($r = 0.78$) and in female a correlation of $r = 0.66$. This was in accordance to study done by Nagasupriya et al which also showed significantly higher correlation in finger prints and lip prints.

CONCLUSION:

Chieloscopy and Dactyloscopy is an important tool in human identification in both civil and criminal cases. There are various studies undertaken to find correlation, and only few of the studies showed the correlation of lip prints and finger prints . Our study show significantly higher correlation but was not statistically significant. This shows that Lip prints and finger prints can be used in identification during forensic investigations. But larger sample size is needed to obtain statistical significant results.

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FIGURE 1: Whorl type

FIGURE 2: ARCH

FIGURE 3: LOOP

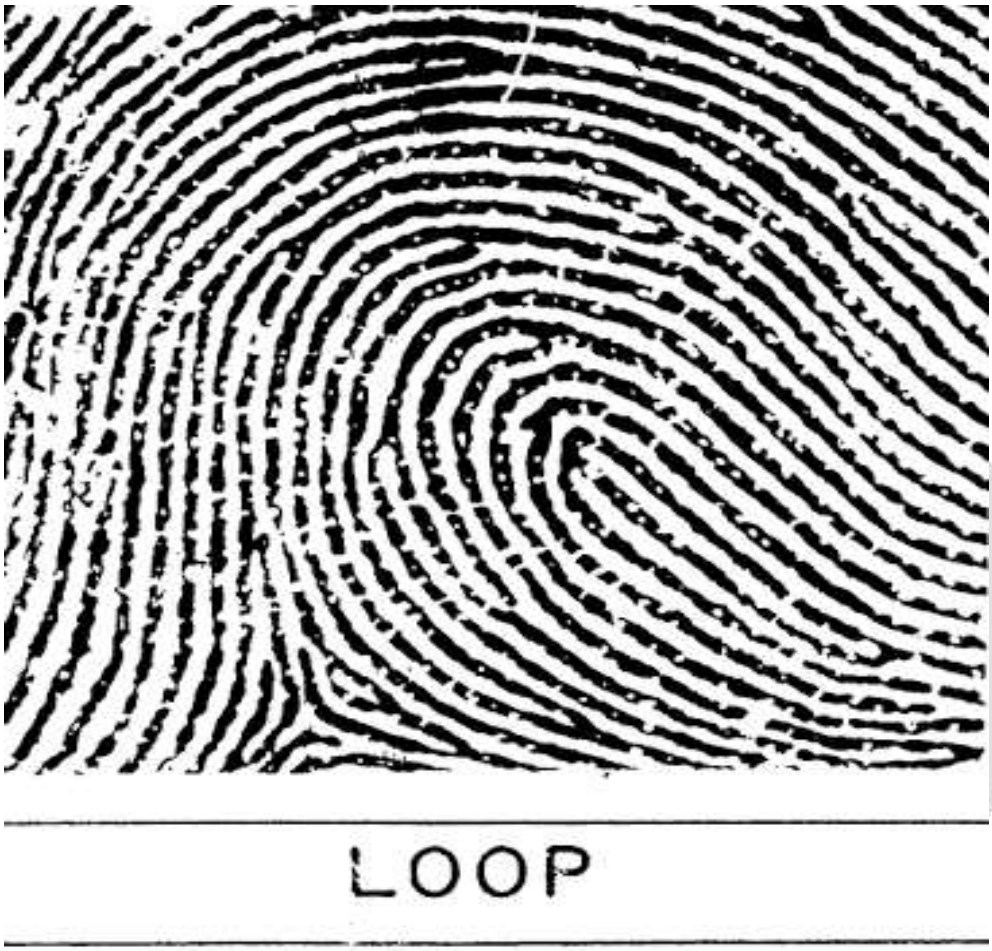

FIGURE 4: LIP PRINT PATTERNS

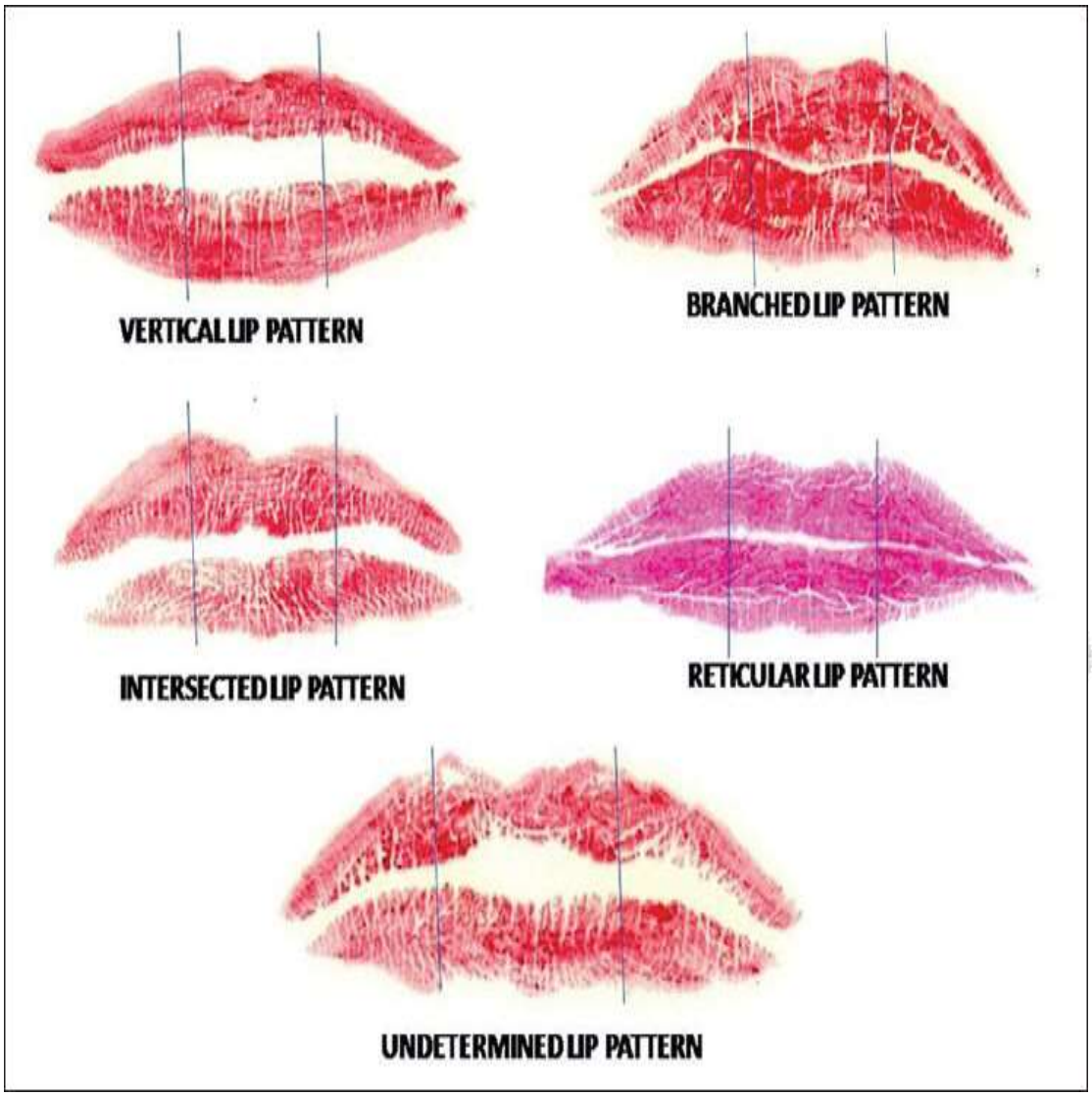

FIGURE 5: LIP PRINTS OF MALES AND FEMALES

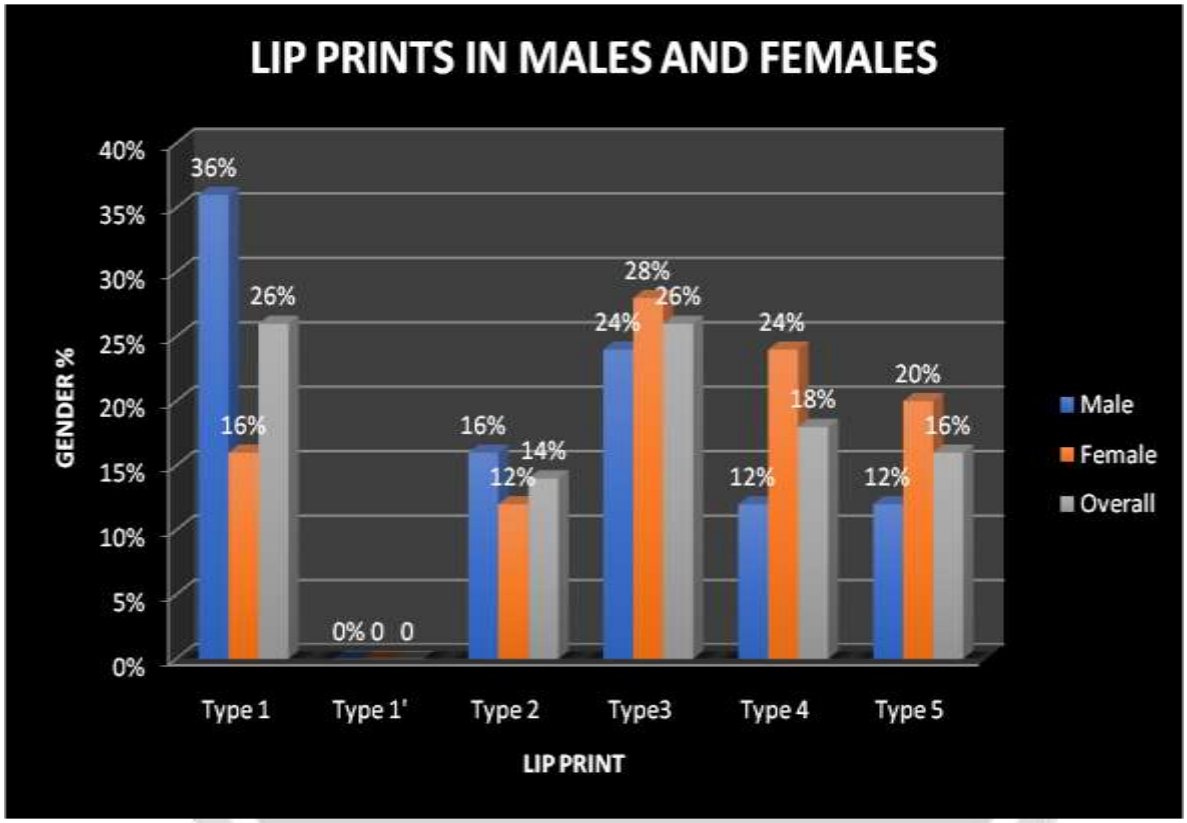

FIGURE 6 : FINGER PRINTS IN MALES AND FEMALES

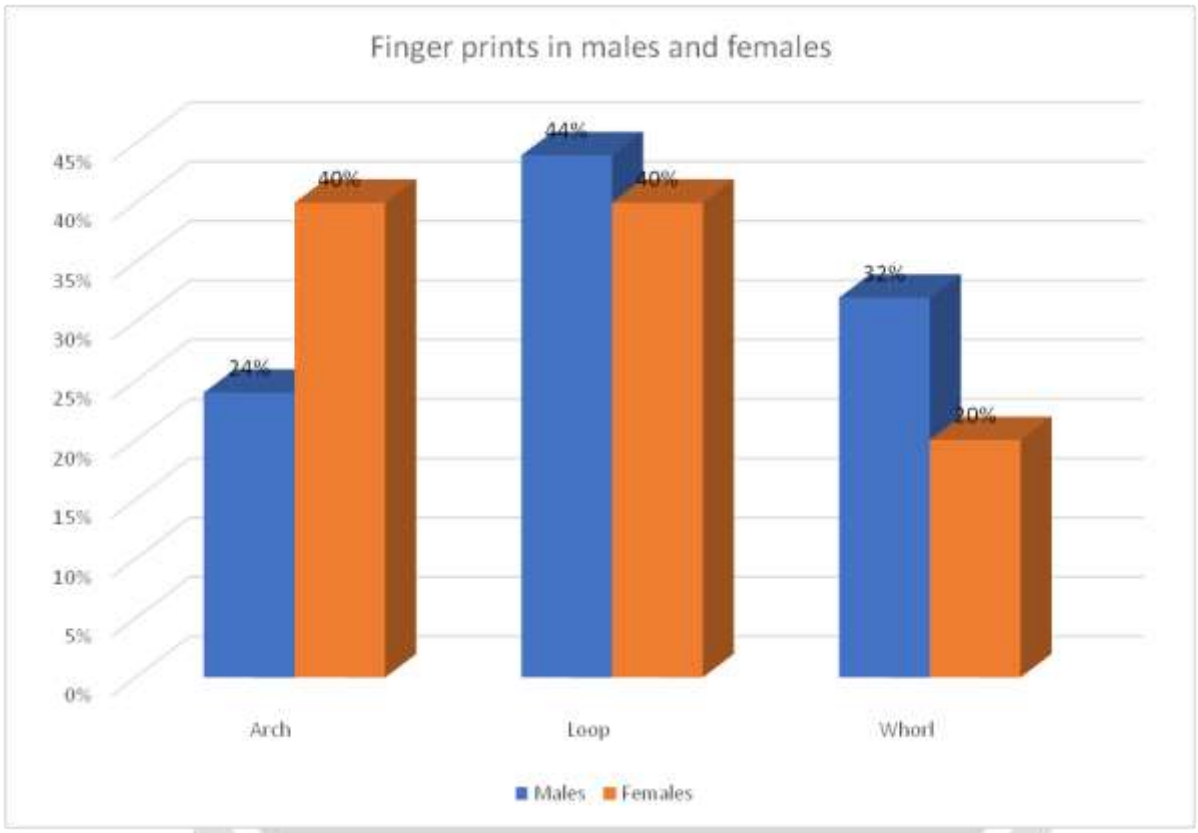

FIGURE 7: Correlation of lip prints and finger prints in males.

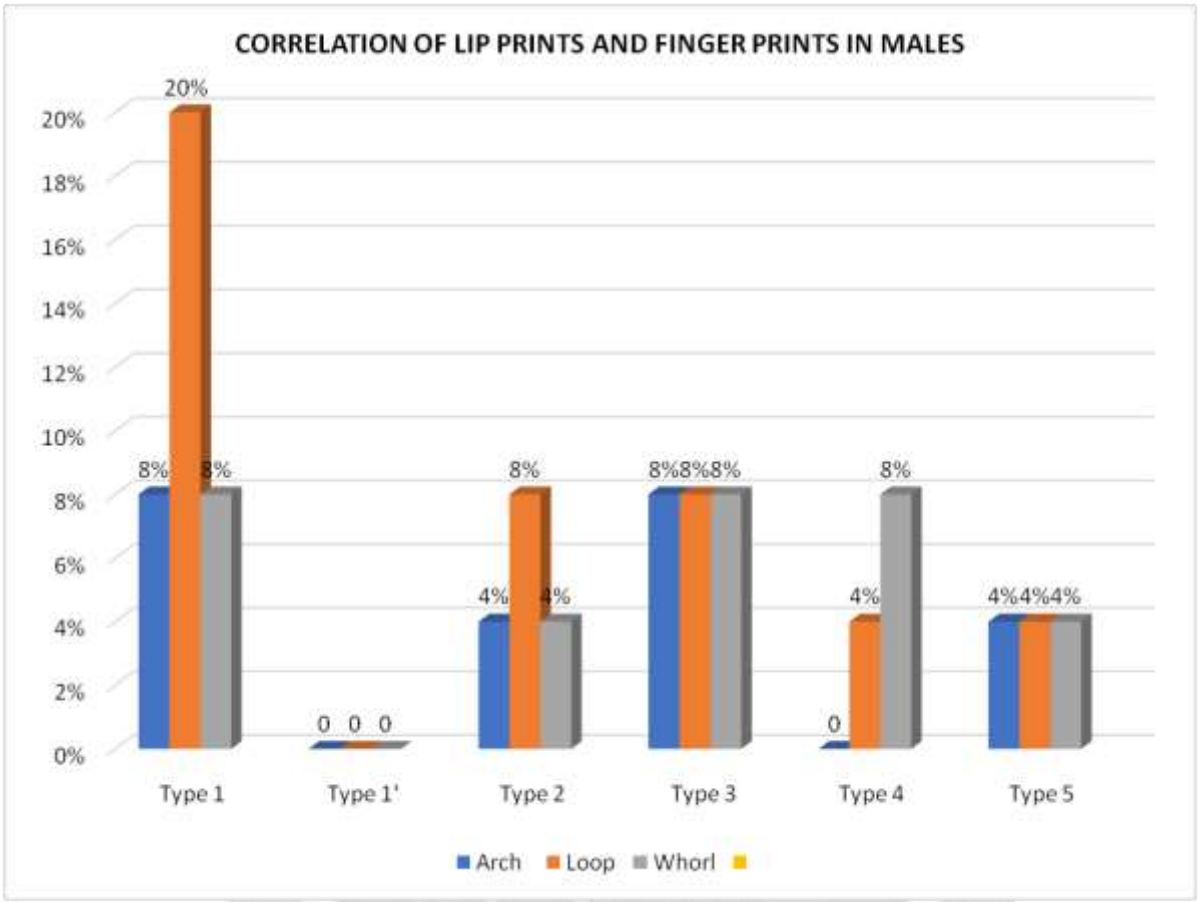

FIGURE 8: correlation of lip prints and finger prints in females

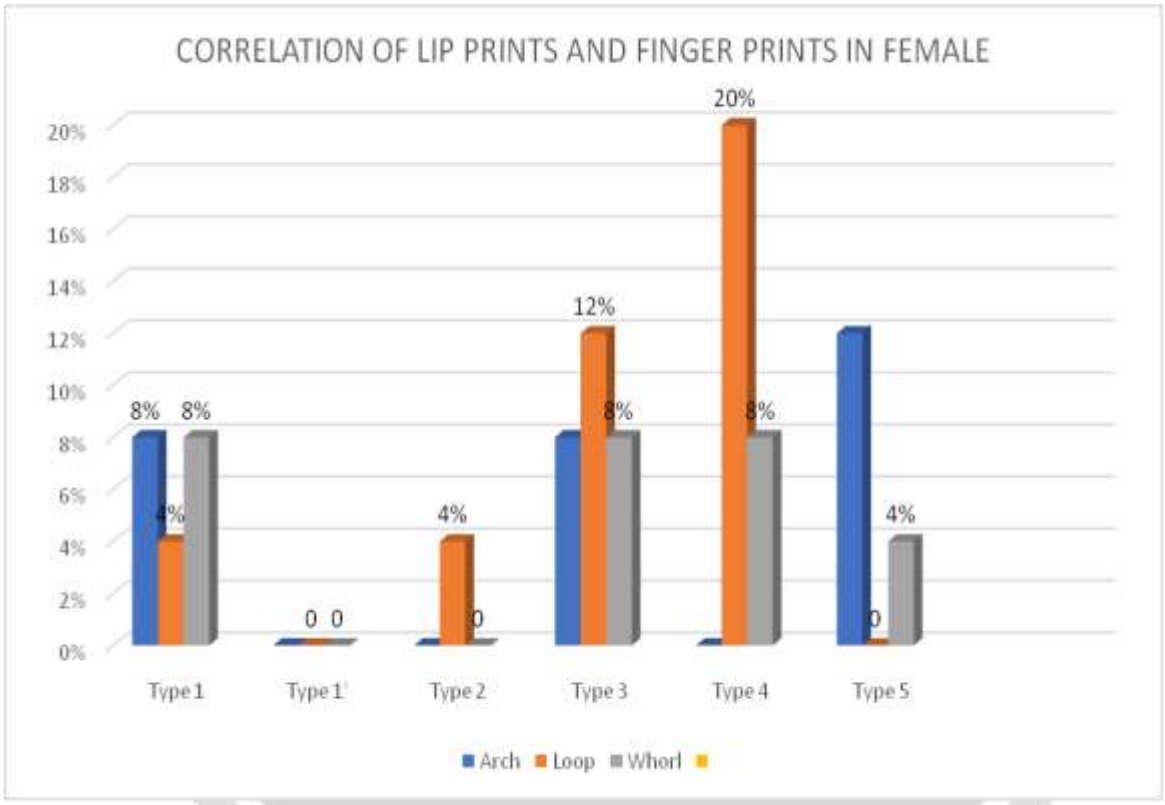

Table 1: Lip prints in males and females

	Male	**Female**	**Overall**
Type 1	36%	16%	26%
Type 1'	0%	0	Nil
Type 2	16%	12%	14%
Type3	24%	28%	26%
Type 4	12%	24%	18%
Type 5	12%	20%	16%

TABLE 2 distribution of finger prints in males and females.

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Finger Print	**Males**	**Females**
Arch	24%	40%
Loop	44%	40%
Whorl	32%	20%

TABLE 3: correlation of lip prints and finger prints in males

	Arch	**Loop**	**Whorl**
Type 1	8%	20%	8%
Type 1'	0	0	0
Type 2	4%	8%	4%
Type 3	8%	8%	8%
Type 4	0	4%	8%
Type 5	4%	4%	4%

TABLE 4: correlation of lip prints and finger prints in Females

	Arch	**Loop**	**Whorl**
Type 1	8%	4%	8%
Type 1'	0	0	0
Type 2	0	4%	0
Type 3	8%	12%	8%
Type 4	0	20%	8%
Type 5	12%	0	4%