Lip Prints of Students in a Medical College - A Observational Study as a Guide to Crime Detection

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Abstract: _Background: Knowledge of criminals about modern techniques used in crime detection by using finger prints has forced the criminals to be cautious while committing crime to mask their finger prints.1In these circumstances the identification of criminals using standard method finger print may fail to identify the criminals. In such incidences the investigators can rely on the lip print available at the crime scene._ _Materials and Methods: An observational study was undertaken on 300 male and 300 female students of JJM medical college. The lip prints of total 600 students was obtained and observed carefully to identify the various patterns and analysed using the Statistical Package for Social Sciences version 20._ _Results: In males Type I' (41.667%) lip pattern is most common which is followed by Type I (22.333%), Type V (18%), Type II (10.667%), least common is Type III and Type IV (3.667% each). In females also Type I' (59.333%) lip pattern is most common followed by Type II (13.333%), Type V (9%), Type IV (8.333%), Type I (6.667%) and least common is Type III (3.333%). It is observed the most common pattern both in males and females was Type I'_ _Conclusion: The study provides a promising results and concludes that lip prints like finger prints is unique for each and every individuals and therefore can be used for personal identification_

Keywords: Lip prints, Finger prints, Tsuchihashi classification, cheiloscopy

1. Introduction

The study of definite pattern of depression and elevations on lip mucous membrane is called cheiloscopy.[2] According to Tsuchihashi and Suzuki K[3] the patterns of lip prints were classified into six types namely Type I-clear cut vertical grooves that run across the entire lip, Type I'-similar to type I but do not cross entire lip, Type II-branched grooves, Type III-intersected grooves, Type IV-reticular grooves, Type V-undetermined. Presence or absence of a particular person at the site of crime can be verified by the supplementary evidence of lip prints.[4] During intrauterine development the lip prints appear as early as 6th week and remain unchanged throughout the life.[5] The lip prints are not changed even after trauma, inflammation and infection by herpes viruses to the lips.[6] The lip prints are permanent and rarely altered by trauma and diseases and hence act as potential tool in identification.[4] Lip impressions have added evidence to a crime scene and this is very much helpful in incidences lacking evidence of finger prints.[7] No doubt that DNA profiling, finger prints and dental records are the standard methods of personal identification but study of lip print has a considerable role.[8] Now a day's criminals are taking utmost precautions while committing crime and hence role of crime detectives is not easy in this fast moving world.[7] Suppose the lip prints are not clear i.e., only shape of the lip is printed personal identification is very difficult and in these cases it is important to examine other substances (e.g.; saliva) which constituted the trace.[9] The biological process of development of furrows on the mucous part of the human lip was first noted by an anthropologist R. Fischer in 1902.[10, 11] The present study was undertaken to evaluate the uniqueness of lip prints and their role in personal identification

2. Materials and methods

An observational study was conducted in 600 medical and dental students aged between 18-24 years in the department of Anatomy of College of Medical Sciences and Teaching Hospital. The materials used for making the lip prints were dark red colour lipsticks, brush, A4 size photocopy papers, magnifying lens, cellophane tape, and pencil. After taking written consent from the students and ethical clearance from Institutional Review Committee of the college, lip prints of the students were taken on A4 size paper by following the procedure as mentioned below:

To record lip print the students were asked to apply lipstick gently and evenly on both the lips using brush and advised to rub both lips gently for uniform spreading. The lip prints were taken on an A4 size photocopy paper in such a way that the central portion of the lip is pressed on the paper first and then pressing to left and right angles of lips uniformly. While taking lip prints the students are advised to prevent smudging of the lip prints. Then cellophane tape was plastered over the impressions to preserve it permanently. Each lip print was numbered and studied very carefully with magnifying lens to analyse the predominant lip pattern in right upper region, left upper region, right lower region and left lower region according to the lip patterns mentioned in Suzuki and Tsuchihashi classification.[3] The collected data was entered and analysed by using Statistical Package for Social Science version (SSPS) 20. Then data was analysed by using descriptive statistical tools. For the continuous variable, the mean and standard deviation were calculated, while categorical variables were expressed in terms of frequency and percentage.

3. Results

In our study it is observed that, the most common type is Type I' (50.5%). followed by Type I (14.5%). Type V (13.5%). Type II (12%), Type IV (6%) and least common was Type III (3.667%). In males the most common type was Type I' (41.667%) followed by Type I (22.33%), Type V (18%). Type II (10.667%), Type III and Type IV (3.667%). In females most common lip pattern is Type I' followed by Type II (13.333%), Type V (9%). Type IV (8.333%), Type I

(6.667%) and Type III (3.333%). It was observed that, both in males and females most common lip pattern was Type I', third most common was Type V and least common was Type III. In Right upper region 128 of the 300 males (42.667%) and 168 0f the 300 females (56%) had Type I' as predominant ones. In Left upper region 132 of the 300 males (44%) and 184 of the 300 females (61.333%) had Type I' as predominant ones. In right lower region 120 of the 300 males (40%) and 184 of the 300 females (61.333%) had Type I' as predominant one. In Left lower region 120 of the 300 males (40%) and 176 of the 300 females (58.667%) had Type I' as predominant one. Results reveals that lip pattern Type I' was most common lip pattern in all the four regions as predominant one.

Table 1: Lip pattern in male students

Type	Right upper quadrant	Left upper quadrant	Right lower quadrant	Left lower quadrant	Total (n/1200)
Predominantly Type I	56 (18.667%)	56 (18.667%)	88 (29.333%)	68 (22.667%)	268 (22.333%)
Predominantly Type I'	128 (42.667%)	132 (44%)	120 (40%)	120 (40%)	500 (41.667%)
Predominantly Type II	48 (16%)	32 (10.667%)	08 (2.667%)	40 (13.333%)	128 (10.667%)
Predominantly Type III	12 (4%)	12 (4%)	12 (4%)	08 (2.667%)	44 (3.667%)
Predominantly Type IV	16 (5.333%)	12 (4%)	12 (4%)	04 (1.333%)	44 (3.667%)
Predominantly Type V	40 (13.333%)	56 (18.667%)	60 (20%)	60 (20%)	216 (18%)
Total	300 (100%)	300 (100%)	300 (100%)	300 (100%)	1200 (100%)

Table 2: Lip pattern in female students

Type	Right upper quadrant	Left upper quadrant	Right lower quadrant	Left lower quadrant	Total (n/1200)
Predominantly Type I	28 (9.333%)	28 (9.333%)	12 (4%)	12 (4%)	80 (6.667%)
Predominantly Type I'	168 (56%)	184 (61.333%)	184 (61.333%)	176 (58.667%)	712 (59.333%)
Predominantly Type II	56 (18.667%)	36 (12%)	36 (12%)	32 (10.667%)	160 (13.333%)
Predominantly Type III	08 (2.667%)	04 (1.333%)	16 (5.333%)	12 (4%)	40 (3.333%)
Predominantly Type IV	16 (5.333%)	20 (6.667%)	32 (10.667%)	32 (10.667%)	100 (8.333%)
Predominantly Type V	24 (8%)	28 (9.333%)	20 (6.667%)	36 (2%)	108 (9%)
Total	300 (100%)	300 (100%	300 (100%	300 (100%	1200 (100%)

Table 3: Comparison of lip pattern between male and female students

Type	Males	Female	Total (n/2400)
Predominantly Type I	268 (22.333%)	80 (6.667%)	348 (14.5%)
Predominantly Type I'	500 (41.667%)	712 (59.333%)	1212 (50.5%)
Predominantly Type II	128 (10.667%)	160 (13.333%)	288 (12%)
Predominantly Type III	44 (3.667%)	40 (3.333%)	84 (3.667%)
Predominantly Type IV	44 (3.667%)	100 (8.333%)	144 (6%)
Predominantly Type V	216 (18%)	108 (9%)	324 (13.5%)
Total	1200 (100%)	1200 (100%)	2400 (100%)

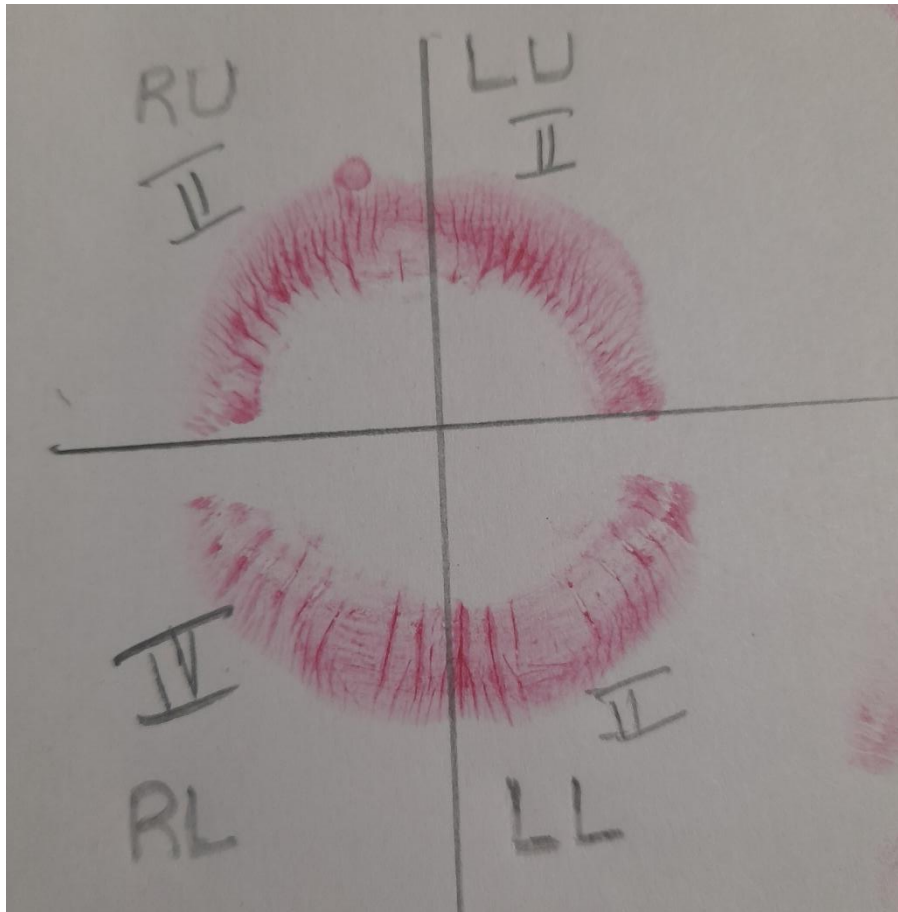**Figure 1:** Showing lip pattern of Type I and Type I'

Figure 2: Showing lip pattern of Type II

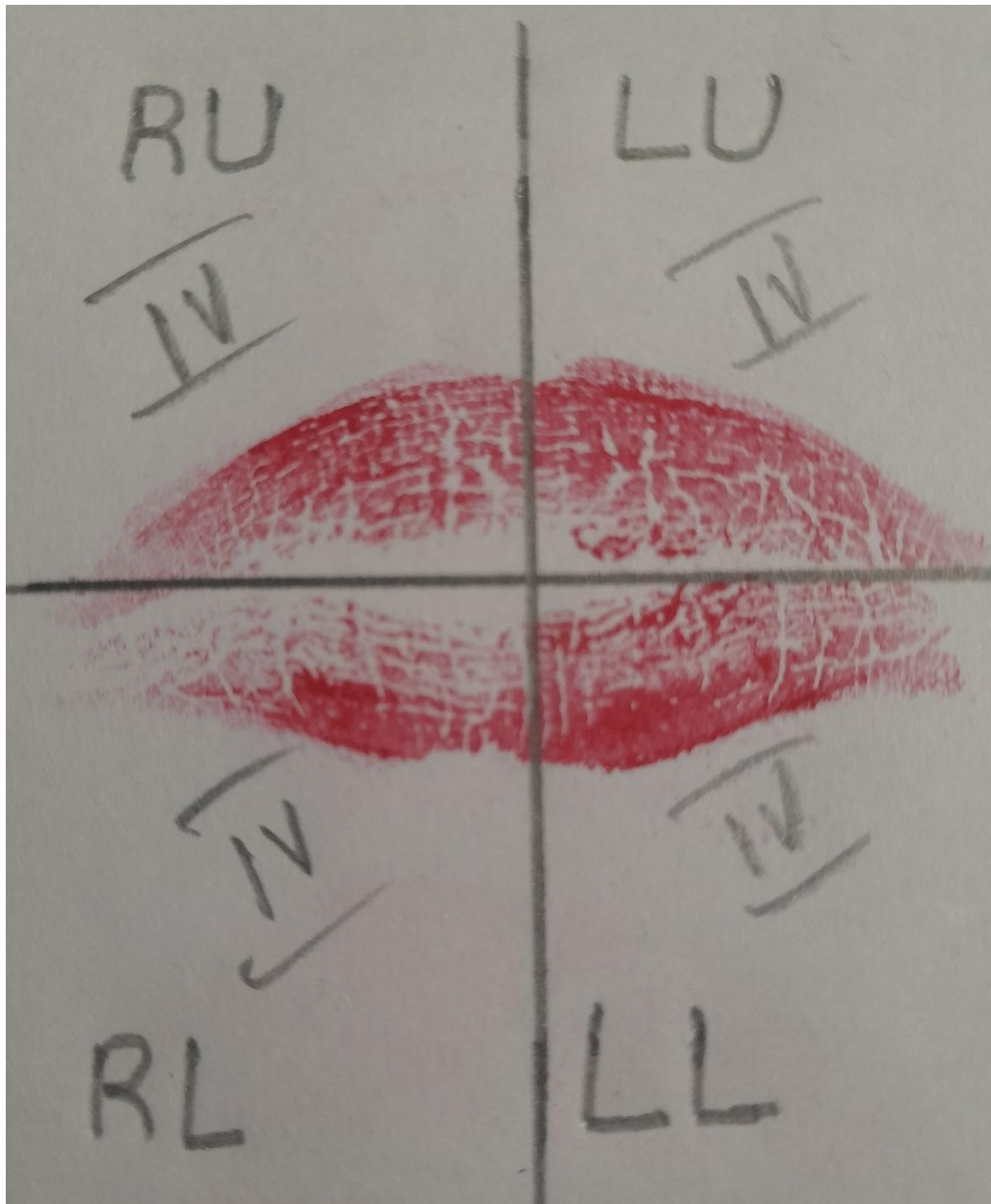**Figure 3:** Showing lip pattern of Type III
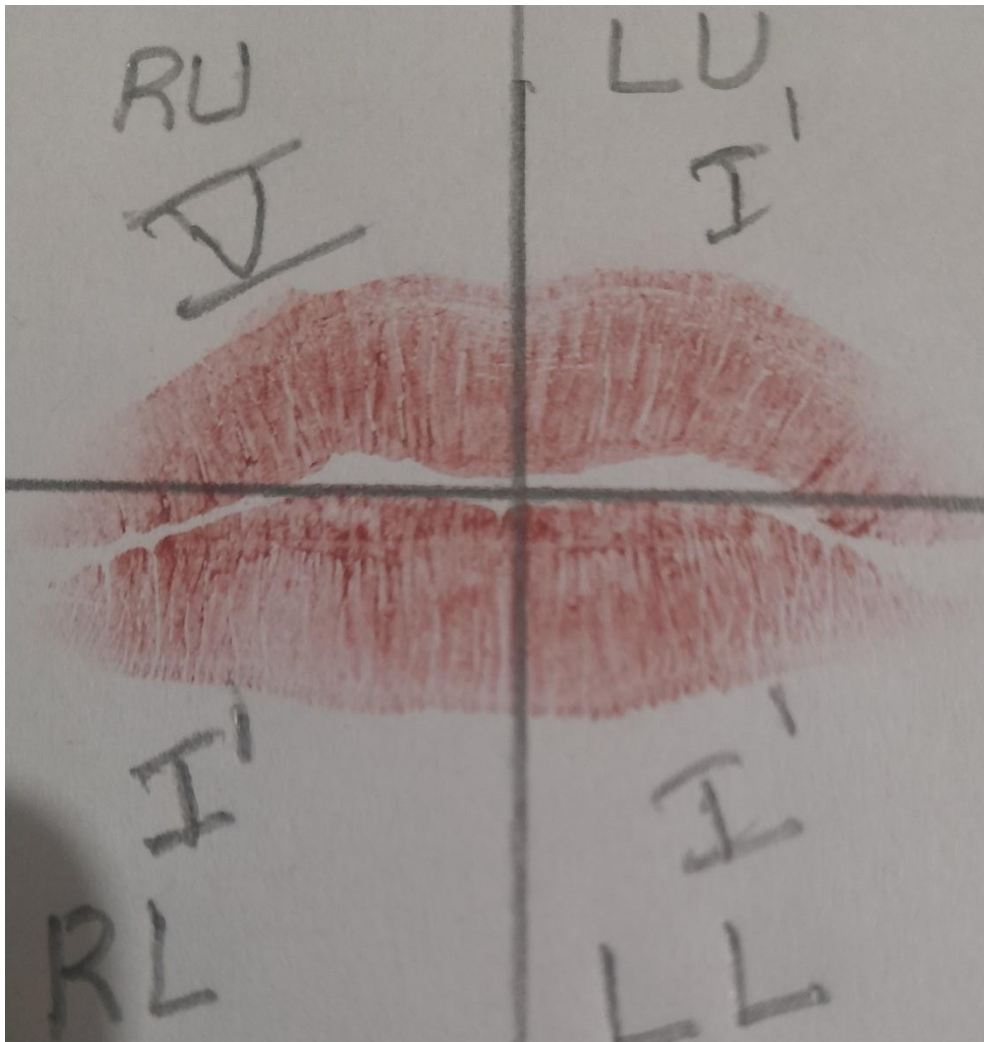
Figure 4: Showing lip pattern of Type IV

Figure 5: Showing lip pattern of Type V

4. Discussion

The present study showed that most common lip pattern in males was Type I' (41.667%) followed by Type I (22.333%) and most common lip pattern in females was also Type I' (59.333%) but followed by Type II (13.333%). The results of the present study do not match with that of the other studies. Sultana et al.[12] found most common lip pattern in males was TypeIII (40%) followed by Type IV (22%) and in females most common lip pattern was Type I (54%) followed by type I' (28%). In a similar study conducted among 250 males and 250 females of the age group 15-60 years, the most common lip pattern both in males (37.78%) and females (34.52%) was Type I followed by Type I' (30.32% in males and 28.8% in females).1Like wise Murkey et al.[13] noted most common lip pattern in males was Type II (20.42%) followed by Type I' (13.64%) and in females it was Type II (17.97%) followed by Type I' (10.78%). Another similar study conducted by Vahanwahal and Parekh [14] among 50 males and 50 females in the age group of 9-21years shows that Type I and Type I' is common in males and Type III common in males. Malik and Goel [15] conducted a study among 50 males and 50 females in the age group of 20-30 years shows that most common pattern in females was Type I and Type I' and in males common patterns are Type IV and Type V.

The region wise analysis of current study showed that, the most common lip pattern in all the four quadrants was Type I' both in males and females. In contrast to present study, studies conducted by other author shows different results. More et al.[16] mentioned that most common lip pattern in Right side of lower lip and Left side lower of lip in females was Type I and Type I' respectively and in males most common pattern was Type II in left side of upper lip. In a similar study conducted by Peter et al.1the most common lip pattern in all the regions of lip was Type I both in males and females except in lower middle region where Type I' predominant in both genders.

The limitation of the present study was that there is no difference in the most common pattern in males and females.

5. Conclusion

Most common lip pattern both in males and females was Type I' which is not comparable with any other available studies as they show different results. This proves that lip pattern is unique for each and every individual and hence can be used for personal identification which may guide in detection of crime

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