Comparative study of cheiloscopy patterns among Indian and Iranian dental students

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Abstract

Aim and Objectives: To assess and establish the cheiloscopy patterns in Indian and Iranian dental students between the both genders and compare both the groups.

Materials and Methods: The study sample consisted of 80 students in the age group of 20-30 years. Lipstick, brush, white paper, adhesive cellophane tape, and magnifying glass were used for the study. Adhesive cellophane tape was used to take the lip print of each individual without any distortion. After carefully removing the cellophane tape, it was stuck onto a white paper. The impression of the lip was split into four segments and it was examined using a glass which can magnify the size of the object which is viewed. Lip imprint impression patterns were segregated using classification given by Tsuchihashi and Suzuki.

Results: Indian and Iranian dental students showed differences in patterns of lip imprints which is of statistical significance.

Conclusion: Lip imprints are specific to a person and unchangeable like fingerprints, so it can be regarded as an important aid in forensic investigations.

Keywords

Cheiloscopy, Indian, Iranian, lip imprints, Tsuchihashi and Suzuki's classification

Introduction

Cheiloscopy is an essential tool in forensic dentistry. It is derived from Greek word “chelios” meaning lips and skopein meaning “to see.” Identifying a human being is one of the main attributes in this field. Like finger imprints, lip prints also play an important role in forensic identification. The grooves present in every individual’s lip is unique, these grooves are called sulci labiorum ruborum. Thus, cheiloscopy can be defined as “a technique of identifying individuals on the basis of the impression of the red area of lips.” It helps in identifying humans with lip traces in crime scenes.1-6

R. Fischer was the first to describe lip prints in the year 1902.1 Edmond Locard suggested the use quilosity for the individual identification in 1932. In 1960, Dr. M Santos and Le Moyne Snyder also advocated the use of cheiloscopy for identification.1,7 In 1966, Santos classified lip prints into two types, viz., simple and compound types. A simple type is subdivided into linear, bend, angled, and S-shaped while compound type was divided into bifurcated, trifurcated, and aberrant.1 Based on thickness he classified, it into four types, viz., mild, moderate, thick and mixed type. In 1970, Suzuki and Tsuchihashi and classified the lip patterns into six types, viz., Type I - complete straight lines that cross the entire lips, Type I' - same as Type I but do not reach the full length of lip, Type II - branched pattern, Type III - bisected, Type IV - reticular pattern, Type V - unclassified patterns which does not fall in above categories.1,2

Aims and objectives

This study was aimed to assess and establish the cheiloscopy patterns in Indian and Iranian Dental students between the both genders and to compare both the groups.

Materials and Methods

The study comprised 80 dental students. It was conducted in the Oral Medicine Department. It comprised of two groups 40 Indians and 40 Iranians. Indian group was divided into two groups with 20 males and 20 females, and similar two groups were made between genders in Iranians.

Inclusion criteria

Individuals with healthy lips between the ages of 20 and 30 years.
Exclusion criteria

Any lesions on the lip such as herpes labialis. Developmental abnormalities such as cleft lip. Those with trauma to the lip region with a significant deformation, known allergic to lipstick were not included in the study.

The materials included for the study were lipstick, white paper, scissors, adhesive cellophane tape, cotton, and magnifying glass as shown in Figure 1. Initially, the lips of the volunteers were cleaned with sterile cotton. Then, the lipstick was applied uniformly along the borders and surface of the lips. The cellophane sheet was cut with the scissors in the dimensions of 6-7 cm length by 3-4 cm wide. Then, the adhesive side of the sheet was glued on the lips, making sure that it has included both the upper and lower borders of the lips as well as the corners of the lips as shown in Figure 2. After making sure that the image has come on the cellophane, it was gently removed and pasted on a white paper. Thus, the lip print was obtained. The lipstick of the volunteers was wiped off using cotton soaked in water.

For analyzing the various quiloscopic patterns, each lip print was split into four segments, viz., right upper segment, left lower segment, left upper segment, left lower segment and right lower segment. Suzuki and Tsuchihashi’s classification system was followed to identify the lip imprints. The lip prints were established using magnifying glass, and the common pattern in all the segments was taken as the category of lip imprint.

Results

Mann–Whitney U-test was used to identify the statistical significance between the various lip patterns. Indian and Iranian dental students showed differences in patterns of lip imprints which is of statistical significance. Type III pattern was found to be the common pattern among Indians (37.5%) followed by Type IV (25%), Type I (12.5%), Type I’ (10%), Type II and V (7.5%), respectively. Type I pattern was the most common pattern seen among Iranian Dental students (52.5%) followed by Type II (25%), Type III and IV (7.5%), Type I’ (5%) and Type V (2.5%), respectively, as shown in Table 1.

When Indian and Iranian males were compared separately, Type III (50%) was the most common pattern observed among Indians male students followed by Type I and IV: 20% and Type I’ and II: 5% each, respectively. Among Iranian males, Type I (55%) was again the predominant pattern followed by Type IV: 15%, Type I’ and III: 10%, Type II and V: 5% each, respectively, as shown in Table 2.

Analysis of the patterns of Indian and Iranian females also showed differences in the distribution of patterns. Type II (45%) was the most common in Indian Female Dental students followed by Type III (25%), Type I (20%), Type I’ and Type IV (5%). Type I (50%) was the most common type seen in Iranian females followed by Type I’ and II: 15%, Type III: 10%, Type IV and Type V: 5% as shown in Table 3.

Discussion

The most common form of lip print pattern is Type III among Indians (37.5%) while Type I pattern among Iranian dental students (52.5%) in the current study. It was in accordance with a study done by Visveswaraiah et al. in 2014[7] where they compared cheiloscopic pattern among South Indians and Iranians. Type III was the most common pattern in various studies done in Indian population group, viz., Augustine et al. (2008)[8] in Delhi, Saraswathi et al. (2009)[2] in Kanpur. While Sandhu et al. (2012)[9] indicated the presence of Type I pattern to be common in Punjab population. Type IV pattern was the most common in Kerala population in accordance with the study done by Verghese et al. (2010).[10] Type V pattern was most common in Goa dental students according to Prabhu et al. (2012).[11] According to the study done by Koneru et al. (2013), Type I was predominantly found in Kerala and Manipuri students. Type III was the predominant pattern in Chennai according to study done by Sivapathasundharam et al. (2001).[13] Type II was the predominant pattern in the study done by Gondivkar et al., (2009).[14]
Various studies done in India showed that few areas have specific patterns which suggest that quiloscopic patterns may be helpful in identifying race and ethnicity of population groups. Lip imprints are created by the movable portion of the lip, so there can be variation in patterns of the same person. The facial expression and amount of lipstick can also produce changes in patterns. Thus, biometric testing for lip prints is demanding and difficult for interpretation.

**Conclusion**

Type III was the predominant lip pattern among Indian dental students while Type I was observed in Iranian dental students. Type III was common in Indian male dental students while Indian female dental students Type II pattern was most commonly observed. Type I was predominant form in both Iranian male and female students. Lip imprints are specific to a person and unchangeable like fingerprints, so it can be regarded as an important aid in forensic investigations. The current study was undertaken using a meagre sample size comprising of Iranian dental students, so studies with larger sample size have to be done to verify these results as there is less available data on lip patterns on Iranian population. Thus, this forensic modality of identification can be used as an adjunctive tool for identification of individuals in the court of law.

**References**
