

ORIGINAL ARTICLE

A Study of Influence of Season on the Lip Prints

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ABSTRACT

BACKGROUND AND OBJECTIVES: Lip prints are the characteristic pattern formed by the wrinkles and grooves on the labial mucosa. Lip prints have recently been recognized as a method of human identification since they are supposed to be unique and they remain unchanged during life of the individual. Though the lip prints remain unchanged, there are certain studies indicating seasonal variation. Hence this study was undertaken to demonstrate if there is a seasonal variation. The study aims to find out if lip prints show any changes with different seasons. **METHODS:** The study was carried out on 100 individuals, of age ranging from 18-28 years males and females who are residing in Dhule district of north Maharashtra after taking consent. The lip prints were collected in the month of May and again it was repeated on the same individuals in the month of December. The materials used were dark brown lipstick, bond paper, cello tape and magnifying lens. **RESULTS:** Lip prints which were collected in two different seasons did not show any gross changes. **CONCLUSION:** More studies should be carried out to observe seasonal variation with more samples and in extreme climates.

Keywords: Cheiloscropy; Forensic investigation, Lip prints; Seasonal Variation

INTRODUCTION

The positive identification of living or dead persons using the distinctive traits and characteristics of the teeth and jaws forms a foundation of forensic science.¹ The biological phenomenon of systems of furrows on the red part of human lips was first noted by anthropologists and Fisher was the first to describe it in 1902.² Lip patterns can be identified as early as the sixth week of intrauterine life.³ Studying in depth and establishing further facts and truth in lip print will certainly help us, as useful evidence in forensic science.⁴ Edmond Locard was one of the France's greatest criminologists who first recommended the use of lip print in personal identification and criminalization.⁵

It has been verified that lip prints recover after undergoing alterations such as minor trauma, inflammation and herpes. However major trauma, any pathosis and surgery to correct it may alter the pattern and morphology of the lip grooves.⁶ Change in seasons cause changes in the skin texture similarly lips also show changes with the climate. Very little has been said or written about the application of lip prints in these days of advanced scientific crime detection. In view of the need of forensic dental services in the different parts of our country it was found necessary to do research on the use of lip prints for person identification.⁷ Hence this study was designed with the prime objective of assessing whether there is any change in lip prints in regard to two seasons and if there is any seasonal impact on particular pattern of lip prints observed.

MATERIALS AND METHODS

Lip prints of 100 individuals i.e. 50 males and 50 females within age range of 18-28 years residing in Dhule district of North Maharashtra comprised the study material. Twice the lip prints were recorded, once in

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the month of May when climate was around 40 degrees and again it was repeated on the same individuals in the month of December when climate was around 21 degrees. Care was taken to select individuals with healthy lips and informed consent was taken from the participants. The study was approved by the local ethical committee. The materials used were dark brown lipstick, lip stick applicator brush, cello tape of width 2 inches, bond paper and magnifying lens. The subjects were made to sit in relaxed position and the lips were thoroughly cleaned with cotton swab dipped in normal saline. Lipstick was applied slowly and uniformly on the lips using lip stick applicator brush. The lipstick was allowed to dry for two minutes. The excess lipstick was bloated by asking the subjects to press the lips against a tissue paper. A piece of cello tape of length 3.5 inches was cut and the glued portion was stuck to the lips in normal rest position carefully taking care to avoid air bubbles. Afterwards the cello tape was removed gently and stuck to the white bond paper carefully avoiding any deformation of the cello tape while sticking to the white bond paper to form a permanent record. To study the pattern of the lips, the lip prints were visualized using magnifying lens. The two samples collected in two different seasons were analyzed and looked for any change.

OBSERVATIONS

Lip prints which were collected in two different seasons i.e. in the month of May and December did not show any change in 77% of the individuals and the same pattern was observed and 23% of the individuals did show changes. The 23% of prints that showed changes didn't show any gross changes in the lip print pattern. Only in these cases the patterns in the winter season showed smudging due to the presence of chapped lips and the grooves were wider. These changes can be attributed because of the low temperature of December. But even then the lip prints were still identifiable with prints collected in May season.

Figure 1: Lip print sample showing change in the summer (a) and winter (b) samples.

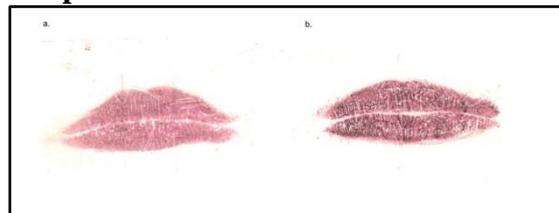
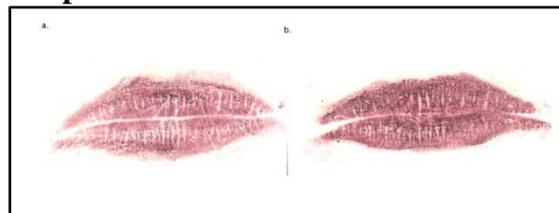


Figure 2: Lip print sample showing no change in the summer (a) and winter (b) samples.



DISCUSSION

It is safe, however, to assume that cheiloscopy, in its present stage of development, has surpassed the limits of a method and has become a means of criminalistics identification.⁸ Criminals make attempts to conceal their identity and try to destroy the finger skin pattern by self-inflicted wounds, by application of corrosives or by abrading the skin. These kinds of manipulations are unlikely to be inflicted by the criminals on their lips. Hence taking lip prints of all the suspected individuals and comparing them with the items found at the scene of crime could give conclusive evidence about the presence of a person at the crime scene. The other investigations become easier once the involvement of a suspect at the scene is confirmed.⁷ Lip prints are unique and do not change during the life of a person.⁹ Injuries to the skin, such as cuts, burns and abrasions, may affect the alignment of ridges and may even result in the destruction of some. Superficial injuries cause only temporary damage; on healing, the patterns and details of the ridges appear as before. When, however, the skin is injured causing destruction of the dermal papillae, scars are formed which result in permanent distortion of the ridges.¹⁰ Similarly, major trauma to the lips may lead to scarring. Any pathosis

affecting the lips and surgical treatment rendered to correct it may affect the size and shape of the lip, thereby, altering the pattern and morphology of grooves.⁶ Being an intermediate zone, the lip is composed of the histologic features of the skin as well as the oral mucosa. Healing response depends upon the depth of the wounds even in the case of lips. But whether the destruction of the dermal papillae leads to scar formation in lips like in the case of skin cannot be said with certainty. Also, the depth of injuries leading to scar formation in lips is yet to be investigated.⁷ Climate changes like in cold and dry weather lips get chapped, with development of deep fissures in few individuals. Can such injuries cause change in the lip print patterns? This is a question whose answer is to be sought. Hence this study was carried out to evaluate the seasonal variations in regard to lip pattern. Lip prints which were collected in two different seasons i.e. in the month of December and May on same individuals did not show any change in 77% (n=100) and 23% (n=100) did show some change. What was noted was that the lip prints in winter season were smudged. The reason being presence of chapped lips in winter season. Also the lip grooves were wider in winter season but the pattern was similar to that seen in summer season. So we can deduce that the lip print pattern does not show any change in regard to season's i.e. summer and winter except that in winter the lip print patterns are wider and smudged in some individuals. But the identification of individual can be very well carried out as the groove pattern does not show any change, but only the thickness of the grooves may show some difference. Similar studies in the past also didn't find any change in the lip print patterns like the studies conducted by Arif M.M et al¹¹, Uma maheshawari¹² and Prabhu R.V. et al.⁷ Patel S et al¹³ conducted study on 100 individuals and repeated it over six month period on same individuals did not show any significant changes when followed for

six months.¹⁴ Vahanwala S. P. and Parek B. K.¹⁵ confirmed that the labial wrinkles and grooves of each individual were identical with the ones taken four months earlier. Similarly Tsuchihashi Y¹⁶ found lip prints to be stable over a period of six months. Hameed et al¹⁴ in a study conducted on 100 individuals from Dakshin Kanada region found change in the lip print pattern collected in the month of April and December in only 10% of individuals. The reason cited by Hameed et al¹⁴ for change in lip prints was due to smudging of lipstick or due to technical problems in collecting the lip prints. Studies in the field of healing pattern and the effect of deep injuries over the groove pattern on the lips are recommended.⁷

CONCLUSION

Therefore we can conclude that lip prints don't show any seasonal variation and hereby confirms the permanence of lip prints. Even if environmental factors and pathologies affecting the lips could bring about changes in lip patterns, it has been observed that the lip prints reassume their former pattern on recovery. Hence lip prints can form a strong and reliable tool in forensic investigation as even the method of collection is feasible and inexpensive.

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