

# Profile of Cheiloscopy in Patient with Melasma: An Observational Study

Satya Wydya Yenny<sup>1</sup>, Rahma Ledika Veroci<sup>2</sup>

<sup>1</sup>Department of Dermatology-Venereology, Dr. M. Djamil Hospital, Medical Faculty of Andalas University, Padang, West Sumatera, Indonesia

<sup>2</sup>Department of Dermatology-Venereology, School of Medicine, Medical Faculty of Andalas University, Padang, West Sumatera, Indonesia

Keywords: *cheiloscopy, melasma.*

**Abstract:** Background: Cheiloscopy is a forensic investigation technique that deals with identification of humans based on lips traces. Several studies had been conducted to determine the distribution of different lip print pattern in some clinical condition with genetic influence, such as hypertention and the inheritance of cleft lip and palate. Melasma is one of skin disease which is also genetically affected. This study was aimed to find out cheiloscopy and its pattern in patients with melasma compared with control. Methods: The study compared lip print pattern between 30 individuals with melasma and 30 healthy controls. Lip prints were collected using cellophane tape and recorded in white chart paper. All four quadrant of lip were observed. Results: Type IV of lip prints dominated all four quadrants in individuals with melasma. From healthy controls, type I was predominant in three quadrants of lip. Conclusion: The result from the present study indicates a significant association between lip print pattern and melasma. Therefore, it may be possible to predict risks of developing melasma in each person with significant association from lip prints.

## 1 INTRODUCTION

Melasma is a common hypermelanosis that typically occurs on sun-exposed are in the face. The appearance of pigment is heightened in the summer when UV exposure is more common. At least three clinical patterns have been described: centrofacial (64%), malar (27%), and mandibular (9%). The course is typically chronic, fading when UV exposure is diminished (Lepeere et al, 2012). Onset of melasma typically occurs in a woman's childbearing years (20s through 30s) and in darker skin types, such as Hispanics, Latinos, Asians, and African-Americans (Lee, 2014).

Melasma is a common hypermelanosis that typically occurs on sun-exposed areas in the face. The pathogenesis is poorly understood, but genetic and hormonal influences in combination with UV radiation are important (Lepeere et al, 2012; Lee, 2014). Racial and/or familial predisposition suggests that genetic factors contribute to the pathogenesis of melasma. Pigmentary disorders including melasma are common in Hispanic and Asian racial groups with Fitzpatrick skin types III/V, although a few

epidemiologic reports are available in different ethnic groups. Studies from different countries address the familial occurrence of the disorder. An epidemiologic study in a tertiary dermatological referral center in Singapore showed that a positive family history was observed in 21 (10.2%) of 205 patients with melasma. A study with 312 patients with melasma in India reported that 104 patients (33.3%) had a positive family history. Positive family history, as high as 54.7%, was shown in a study on 400 pregnant women in Iran. Familial occurrence is as high as 56.3% of 302 patients from Brazil. Although the rate of occurrence from different countries and even from the same country shows a wide range of differences, family history is associated with melasma on epidemiologic study. However, to date, there is no study about cheiloscopy in melasma.

Cheiloscopy (quiloscopy) can be defined as a method of identification of a person based on characteristic arrangement of lines appearing on the red part of lips or as a science dealing with lines appearing on the red part of lips. It is unique to an individual, except for monozygotic twins. Lip groove patterns can be identified from the 6th week of intrauterine life (Peter et al, 2016).

Fischer in 1902 was the first anthropologist to describe the furrows on the red part of the human lips. However, it was only in 1932 that Edmond Locard, one of France's greatest criminologists, recommended the use of lip prints in personal identification and criminalization. In 1950, Synder reported in his book *Homicide Investigation* that the characteristics of the lips formed by lip grooves are as individually distinctive as the ridge characteristics of fingerprints. Suzuki and Tsuchihashi, in 1970, devised a classification method of lip prints, which is as follows (Peter et al, 2016; Singh et al, 2017; Mishra et al, 2009; Prabhu et al, 2012):

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 groove
6. Type V: irregular/other pattern

Lip prints are unique and do not change during the life of a person. It has been verified that lip prints recover after undergoing alterations like minor trauma, inflammation and diseases like herpes. The form of the furrows does not vary with environmental factors (Gondivkar et al , 2009). Study shows that lip print pattern does not change even as age advances. Besides, cheiloscopy is easier to perform, very helpful due to its unique pattern and often more helpful in criminal investigations when other identification methods or parameters are either not available or difficult to analyze (Nagrle et al, 2014).

Several studies had been conducted to determine the distribution of different lip print pattern in some clinical condition with genetic influence, such as hypertension and the inheritance of cleft lip and palate. Melasma is one of skin diseases which is also genetically affected. This study was carried out to identify the peculiar lip patterns in patients with melasma, whether it could be act as predictor for individuals to get melasma later. As the final goals, it might be use as preventive methods for melasma as early as possible.

## 2 METHODS

A study sample comprised 30 females with melasma and 30 females without melasma. All samples were aged between 20 and 55 years. Lips were free from any pathology, having normal transition zone between the mucosa and skin were included in the study. Consent of all the samples was obtained for the study.

In order to classify the lip prints in this study, the classification scheme proposed by Suzuki and Tsuchihashi was used. Materials used were:

1. Red or brown colored lipstick
2. Cellophane tape and scissors
3. White chart paper
4. Magnifying lens

First, lips were cleaned thoroughly. Individuals with hypersensitivity to lipsticks were not included in the study. A lipstick was applied with single stroke, evenly on the vermilion border. The subjects were asked to rub both lips to spread the applied lipstick. After two minutes, over the lipstick, the glued portion of cellophane tape strip was placed and the subject was asked to make lip impression in normal rest position of the lips by dabbing it in the center first and then pressing it uniformly toward the corners of the lips. The cellophane strip was then stuck to a white chart paper and then analyzed by using magnifying lens. The lips were divided into four quadrants; two quadrants on each lip, and were numbered from Q1-Q4 in a clock-wise sequence starting from upper right.

## 3 RESULTS

The lip print patterns were studied in 30 samples that clinically diagnosed with melasma, compared with 30 healthy controls. Ethical approval was obtained and all participants were explained about the purpose of the study and also the informed consent was obtained from each of the participant. The study of lip print pattern of 60 samples including cases and controls revealed the following observations on Figure 1 and 2.

## 4 DISCUSSION

Lip prints are very useful in forensic investigation and personal identification. They are considered to be most important forms of transfer evidence, and are analogous to finger prints (Sharma et al, 2009; Telagi et al, 2011).

In the present study, it was noticed that no two individuals or more have similar types of lip prints. Table 1 shows the distribution of lip print patterns between individuals with melasma and healthy controls. It revealed that each quadrant (Q) of lips had a tendency towards a certain type. In 30 healthy controls, type III was found in 11 (36.67%) samples in Q1, type I as much 10 (33.33%), 13 (43.33%) also 13 (43.33%) in Q2, Q3 and Q4 respectively.

Table 1. Distribution of Lip Print Patterns

TYPES	QUADRANT 1		QUADRANT 2		QUADRANT 3		QUADRANT 4	
	CASES (n)	CONTROL (n)	CASES (n)	CONTROL (n)	CASES (n)	CONTROL (n)	CASES (n)	CONTROL (n)
Type I	5	8	4	10	4	13	5	13
Type I'	3	0	3	0	3	3	3	3
Type II	2	6	3	6	2	1	1	2
Type III	1	11	3	8	8	8	8	8
Type IV	19	5	17	6	13	5	13	4
Type V	0	0	0	0	0	0	0	0
TOTAL	30	30	30	30	30	30	30	30



Figure 1. Photograph of lip print of patient with melasma



Figure 2. Photograph of lip print of healthy control

Type I, vertical groove pattern, have a higher quantity in healthy controls. Vahanwalla and Parekh (India, 2000) studied lip prints from 50 male and 50 female subjects from Mumbai and found that type I (branched) was predominant in the lower lip among the females (Umana et al, 2014).

Otherwise, type IV of lip prints dominated all four quadrants in individuals with melasma. From the study of lip prints, 19 (63.33%) samples of type IV were found in Q1, 17 (56.67%) in Q2, whereas 13 (43.33%) samples in Q3 and Q4. The difference pattern between cases and healthy controls is significant. In other words, the research shows a higher frequency of reticular groove type in melisma (51.67%) than in healthy control (16.67%). From literature there has been no research on lip print pattern of melasma that could be comparison. To our knowledge, this study is the first study of lip print pattern in melasma.

## 5 CONCLUSION

During the past decade, numerous studies addressed the uniqueness of lip groove patterns and it was proved that it could be used for personal identification. The tremendous research done in this field itself proves its worth as a unique entity (Peter et al, 2016). Research of lip print patterns in clinical condition with genetic influence

The result from the present study indicates a significant association between lip print pattern and melasma. Therefore, it may be possible to predict risks of developing melasma in each person with significant association from lip prints. It can therefore serve as a non-invasive predictive tool in determining those people who are at risk of developing melasma so that clinicians and the general public at large can be informed and habits that could trigger melasma can be avoided.

Despite the fact that identification of an individual by lip prints appears to be accepted in some places, this procedure requires further studies with larger sample size. The uniqueness of lip prints pattern in melasma needs to be more confirmed and accepted.

## ACKNOWLEDGMENT

This study was not sponsored and there are no conflicts of interest.

## REFERENCES

- Bello, A., 2014. Dermatoglyphics and Cheiloscopy Pattern in Hypertensive Patients; A Study in. *International Journal of Scientific and Research Publications* 4, 2250–3153.
- Gondivkar, S., Indurkar, A., Degwekar, S., Bhowate, R., 2009. Cheiloscopy for sex determination. *Journal of Forensic Dental Sciences* 1, 56. doi:10.4103/0974-2948.60374.
- Lapeere H, Boone B, De Schepper S, et al. 2012. Hypomelanoses and Hypermelanoses. In: Wolff K, Goldsmith LA, Katz SI, Gilchrist BA, Paller AS, Leffel DJ, editors. *Fitzpatrick's dermatology in general medicine*. 8<sup>th</sup> ed; vol.1. New York: McGraw-Hill; p.804-26.
- Lee, A.Y., 2014. An updated review of melasma pathogenesis. *Dermatologica Sinica*. doi:10.1016/j.dsi.2014.09.006
- Mishra, G., Ranganathan, K., Saraswathi, T., 2009. Study of lip prints. *Journal of Forensic Dental Sciences* 1, 28. doi:10.4103/0974-2948.50885
- Nagrle N, Bipinchandra T, Murkey P, Patond S. 2014. Establishing cheiloscopy as a tool for identification: an assessment on 500 subjects in central India. *Al Ameen Journal Medical Science*.;7(3):201-206.
- Peter T, Chatra L, Ahsan A. 2016. Cheiloscopy. *International Journal of Forensic Odontology*.;1(2):48-52.
- Prabhu, R.V., 2012. Cheiloscopy : Revisited. *Journal of Forensic Dental Sciences* 4, 47–52. doi:10.4103/0975-1475.99167.
- Sharma, P., Saxena, S., Rathod, V., 2009. Cheiloscopy: The study of lip prints in sex identification. *Journal of Forensic Dental Sciences* 1, 24. doi:10.4103/0974-2948.50884
- Singh Y, Pandey P, Srivastava A, Solanki S. 2017. New Insights of Cheiloscopy. *Annals of International medical and Dental Research*.;3(3):11-15.
- Telagi, N., Mujib, A., Spoorthi, B., Naik, R., 2011. Cheiloscopy and its patterns in comparison with ABO blood groups. *Journal of Forensic Dental Sciences* 3, 77. doi:10.4103/0975-1475.92150