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Original Article

Forensic dissection of lip print as an investigative tool in a mixed Egyptian population

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ABSTRACT

Background: Identification is a major problem facing forensic practitioners, DNA and finger prints are highly useful but sometimes aren't easily collected from the crime scene. Lip print could be useful in this field being unique to each individual. **Aim:** The current study aimed at detecting the frequency and gender relation of lip print pattern in an Egyptian sample. **Methodology:** Samples were collected on white copy paper, divided into four quadrants then examined with magnifying lens for pattern distribution. **Results:** The study showed that pattern IV was the most frequently represented pattern in the study sample, pattern I & II were more prevalent in males and females respectively. Prevalent pattern in Cairo and Lower Egypt was I while it was IV in Upper Egypt. **Conclusion:** The lip print pattern can differ due to gender and geographical origin in Egyptian subjects.

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1. Introduction

In various civil, criminal and mass disaster cases, positive identification of unrecognizable deceased individuals could be very difficult. Out of the many existing techniques used for this purpose; comparison of fingerprints, DNA and dental records are probably the most common techniques applied. However, human lip print recognition is one of the most interesting emerging fields in confirming personal identification.¹

Lip prints are defined as normal wrinkles and grooves present in the zone of transition of human lip, between the inner labial mucosa and outer skin, examination of which is known as Cheiloscopia. Those patterns are identifiable as early as the sixth week of intrauterine life. Lip print gained its importance being a unique feature for each individual, as finger prints. Research studies regarding the use of lip prints as evidence in personal identification and criminal investigation are scanty. However, studying it in depth and establishing further information concerning lip prints will certainly help as useful evidence in forensic practice.²

Fischer, 1902 was among the first to take notice of the biological phenomenon of systems of furrows on the red part of human lips in the year 1902. While the use of lip prints in personal identification and criminalization was first recommended in France by Edmond Locard as early as 1932. Le Moyne Snyder was the first to introduce a case in which lip prints helped the crime investigators in an unusual way. Suzuki and Tsuchihashi were among the first to classify the various patterns present on the human lips.³

Lip prints could be left at crime scenes on various objects, e.g. drinking glasses, cigarette butts, and duct tape. Both direct inspection and photography allow more precise and detailed observations needed for lip print investigations. Proper investigation of the individualizing characters of lip prints is essential to identify suspects and further confirm their presence in crime scene.⁴

The oily and moist secretions from sebaceous and salivary glands located at the vermillion border (which is the sharp demarcation between the lip and the adjacent normal skin) and subsequent moisturization from the tongue enables the formation of a latent lip print whenever there is contact with lips leaving behind an important form of transfer evidence. A lip print at the scene of crime can offer a clue for different questions as the type of the crime, the number of the people involved, sexes of suspects, cosmetics used, habits, occupational traits, and the pathological changes of lips themselves.⁵

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Lip groove patterns rarely change, resisting numerous types of external factors including physical injury, pressure and exposure to hot or cold stimuli. Its permanence enables it to be a reliable tool in forensic field investigations. Especially when combined with other evidence, it greatly adds to the success of crime solving mystery.⁶

Studies related to geographical origin are always an important step for confirming identification. There were no enough data to correlate sex and geographical distribution to lip pattern. Our study aimed to detect lip pattern among some Egyptians of both sexes and of different geographical distribution.

2. Method

2.1. Subjects

The collected specimens in the research belonged to 221 randomly selected adult Egyptian volunteers of both sexes and of various geographical origin.

Exclusion criteria: Any participant suffering from an inflammation, scars, deformity or past history of plastic surgery in the lips was excluded from the study.

Ethical considerations:

- An informed valid consent was taken from each participant.
- An approval was obtained from Ethics committee.
- In order to secure confidentiality, specimens were coded and anonymously stored.

2.2. Recording the lip prints

Dark Red or brown, non-persistent, non-glossy, non-metallic lipstick was used to get clear lip prints. White paper (white A4 Globules classic 80-g copy paper) was used to take the impressions of the lips. A thin film of lipstick was applied onto cleaned and dried lips, left for 5 min, and then the impressions of the lips were taken on the specified papers. The following method was used for taking the impressions from every subject. Direct light pressure was applied by the lips on a standardized properly folded paper then they were stored in a card board box under suitable environmental conditions.

2.3. Examination of the prints

Each lip print was divided into four topographic areas (QI, QII, QIII, QIV) after a study conducted by Santos in 1967,¹ examined by magnifying hand lens with direct light focused on it. The lip print was classified into 4 patterns according to K. Suzuki and Y. Tsuchihashi's classification.³ Figs. 1–4.⁷



Fig. 1. Pattern I: Vertical.



Fig. 2. Pattern II: Branched.



Fig. 3. Pattern III: Intersecting.



Fig. 4. Pattern IV: Reticulate.

3. Results

In our study 221 patients were enrolled. Lip print was studied from 4 lip quadrants yielding 884 samples, 4 types of patterns were analyzed (I–IV) (see Table 1).

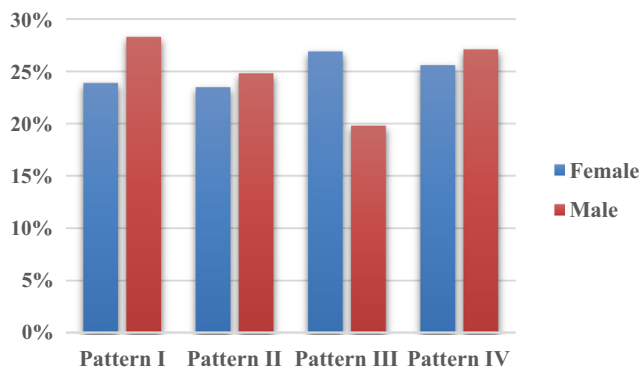


Fig. 5. Column chart showing distribution of different lip patterns as regards gender distribution among Egyptian participants involved in the study.

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