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Estimating Age Of An Individual By Analyzing Lip Prints Through Afchar Bayat Classification

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Abstract: 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 Cheiloscopy. Those patterns are identifiable as early as the sixth week of intrauterine life. This study explores the potential of using lip prints to estimate an individual's age through the Afchar Bayat classification system. Lip print samples were collected from individuals of varying ages 21 to 50 and analyzed using the Afchar Bayat classification system. The findings of this study contribute to the development of new methods and techniques for age estimation in forensic science and highlight the importance of lip print analysis in interdisciplinary research.

Key words: Lip prints, wrinkles, grooves, labial mucosa, cheiloscopy, intrauterine life, Afchar Bayat classification, age estimation, forensic science.

Introduction

Personal identification is becoming significant not only in legal medicine but also in criminal investigation, identification, and genetic research. Lip prints are distinct lines and fissures in the forms of wrinkles and grooves present in the zone of transition of the human lip, between the inner labial mucosa and outer skin examination known as cheiloscopy. Cheiloscopy derived from Greek word chelios -lips and skopein - the study of lip prints.(S. chawre,2021)

A formal technique called cheiloscopy, sometimes referred to as quiloscopy, is used to identify people based on the distinctive pattern of lines on their lips. Ananthropologist named Fischer originally described this method by examining the ridges and indentations on the red portion of human lips. Edmond Lochard pioneered the use of lip prints for identity and criminal prosecution (K. Randhawa, 2011)

Cheiloscopy of lip prints is primarily divided into six patterns. Clauco martin santos classification, Suzuki and Tsuchihashi's lip print classification, Renaud lip classification, Afchar-bayat classification, Kasprzak classification. In forensic dentistry, lip prints can be used as important evidence if careful investigation yields new information. If a person has left lip marking son exhibits like glassware, clothing, tissues, and napkins, these can be utilized to determine whether or not they are a suspect in a crime because of their lifelong consistency (Ambrish Kaushal, 2020)

The latter is particularly useful in forensic age estimation, as subtle morphological changes in lip prints occur over time. These changes may help forensic experts determine an individual's approximate age, which can aid in criminal profiling and investigations. Additionally, research suggests that lip print patterns may show variations between males and females, adding another dimension to forensic analysis. Forensic experts collect and analyze lip prints using different techniques. Common methods include photographic documentation, powder and tape lifting, and lipstick application on paper or glass surfaces. High-resolution imaging and digital

enhancement techniques further assist in improving the accuracy of identification. However, there are challenges in lip print analysis, such as distortion due to environmental factors, smudging, and the lack of universal classification standards. Despite these limitations, lip prints continue to gain recognition as an important forensic tool, complementing other biometric identifiers in criminal investigations.

Afchar-Bayat's classification of lip prints emerged as an alternative system to previous models, such as the well-known Suzuki and Tsuchihashi classification (1970).

This classification aimed to provide a more structured and refined categorization of lip prints based on observed patterns and forensic applicability. It focused on enhancing forensic identification by defining specific types of lip groove formations.

This classification system provided a structured approach for forensic experts to analyze and compare lip prints found at crime scenes with those of suspects.

Afchar-Bayat's classification simplified lip print analysis by reducing the number of categories while maintaining accuracy. It improved forensic comparison methods, making it easier to distinguish between individuals based on their lip patterns.

The system has been referenced in various forensic studies as an alternative to other classification methods, highlighting its importance in forensic investigations.(Ines Maria Caldes 2007)

Here is the classification is explained,

Afchar–Bayat Classification (1979):

A1: Vertical and straight grooves covering the whole lip

A2: Vertical and straight grooves, but not covering the whole lip

B1: Straight, branched grooves

B2: Angulated branched grooves

C: Converging grooves

D: Reticular pattern grooves

E: Other grooves (Dr.Smita Chaware 2021)

LITERATURE REVIEW

SP Vahanwala, BK Parekh (2000), Conducted study on, "Study of lip prints as an aid to forensic methodology". The labial wrinkles and grooves of each of the individual was identical to the ones taken earlier. No two lip prints matched with the other, thus making it characteristic of an individual and thereby being a potential identification mark. Type I & II were most commonly seen in the First quadrant. Likewise combination of the patterns in each individual was unique.

Preeti Sharma, Susmita Saxena, Vanita Rathod, (2009), Conducted study on, "Comparative reliability of cheiloscopy and palatoscopy in human identification". This study not only showed that palatal rugae and lip prints are unique to an individual, but also that lip prints is more reliable for recognition of the sex of an individual. Statistical analysis (applying Z-test for proportion) showed significant difference for type I, I', IV and V lip patterns ($P< 0.05$) in males and females, while no significant difference was observed for the same in the palatal rugae patterns ($P> 0.05$).

Shilpa Patel, Madhusudan AS, Gayathri Ramesh, Sowmya GV, (2010) Conducted study on, "A study of lip prints in relation to gender, family and blood group". The present study showed a good consistency of the lip print pattern when observed for a period of six months consecutively. The study has not found any statistical correlation of lip print with family members or even any correlation between blood group and lip prints.

AIM AND OBJECTIVES :

Aim : To estimate Age of an individual through lip prints by using Afchar - Bayat classification

Objectives :

1. To analyze lip prints from diverse group of individuals (age group 21-50)
2. To study the relationship between lip prints patterns and age using afchar bayat classification.
3. To analyze prominent lip print pattern among age group of 21 years – 50 years

METHODOLOGY:

Lip print Recording :

Before collecting lip prints, participants were briefed on the study's objectives and asked for their consent. Individuals with congenital deformities, lip inflammation, or injuries were excluded from volunteering.

Firstly Lips were cleaned with the tissue paper. To imprint the lip prints, a dark red lipstick was applied to individuals lips.

Individual were asked to relax without stretching their lips, 2-3 inches long adhesive tape was applied on the lips. At the center portion it was dabbed first, then left and right corner of lips was pressed applying uniform pressure, taking care to avoid sliding of lips to prevent smudging of lip print and instruction was also given that the lip should not be moved while lifting. Then the adhesive tape was removed slowly from one side and it was collected on a bond paper containing the details such as their name, sex, age.

After numbering the lip print and placing it over white paper, analysis, and examination were conducted.

A few Lip print samples were collected from small villages called kummarapalli & kothapeta Chittoor Dist. Andhra Pradesh and few samples were collected from GTN arts college, Dindigul Dist. Tamil Nadu.

Lip Print Classification (Afchar-Bayat System):

Each lip print will be classified into one of Afchar-Bayat's predefined patterns (e.g., vertical, branched, reticular, etc.).

Data Analysis:

Feature Extraction:

Collected samples were divided into three groups based on the age category such as,

Group I consists of age group 21 – 30 years,

Group II consists of age group 31 – 40 years,

Group III consists of age group 41 – 50 years.

For analysis of lip print characteristics such as pattern distribution.

Age Estimation Model Development:

Statistical Analysis: Using correlation tests (e.g., Pearson's correlation) to assess the relationship between age and lip print patterns.

Ethical Considerations:

Informed Consent: Participants will sign consent forms before participation.

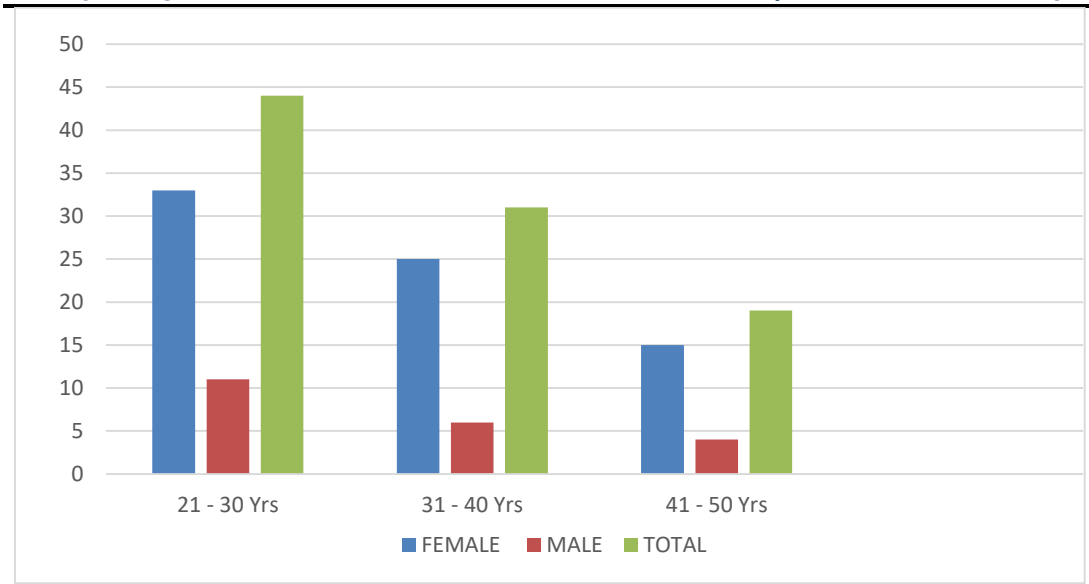
Privacy & Confidentiality: Personal data will be anonymized.

Ethical Approval: The study will be reviewed and approved by an Institutional Ethics Committee.

DISCUSSION

AGE CATEGORY	FEMALE	MALE	TOTAL	MAJOR TYPE
21 - 30Yrs	33	11	44	B1, C, D
31 - 40Yrs	25	06	31	B1, B2, E
41 - 50Yrs	15	04	19	A2, B1

Represents age category of in which 21-50 years age group is taken from both females and males. Samples collected from age group 21-30 years are 44 samples, in that 33 from females, and 11 samples from males are collected & most observed lip print types are B1, C, D. Samples collected from age group 31-40 years are 31 samples, 25 samples are from females and 06 samples are from males are collected & most observed lip print type is B1, B2, E. Total samples collected from age group 41-50 years are 19 samples,15 samples from females and 04 samples from males are collected & most observed lip print type isA2, B1.



RESULT :

In the Group I of age category 21 – 30 years, the total samples collected from both females and males are 42, in which 32 are females & 10 are males. The most found type of lip print characteristics by using Achar Bayat Classification is B1 (Straight, Branched grooves), C (Converging grooves), D (Reticular pattern grooves).

In the Group II of age category 31 – 40 years, the total samples collected from both females and males are 30, in which 25 are females & 05 are males the most found type of lip print characteristics by using Achar Bayat Classification is B1 (Straight, Branched grooves), B2 (Angulated branched grooves), E (Other grooves).

In the Group III of age category 41 – 50 years, the total samples collected from both females and males are 18, in which 14 are females & 04 are males the most found type of lip print characteristics by using Achar Bayat Classification is A2(Vertical and Straight grooves, but not covering the whole lip), B1(Straight and branched grooves).

CONCLUSION

This study aimed to investigate the potential of using lip prints to estimate the age of an individual through the Afchar Bayat classification system.

By exploring the potential of lip print analysis for estimating age, this study contributes to the development of new methods and techniques in forensic science.

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