International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 02, 2020
ISSN: 1475-7192

CORRELATION OF LIP PRINTS WITH PALATAL RUGAE

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***Abstract**:*

Human identification is necessary for personal, social, and legal reasons. Lip print patterns and Palatal Rugae, taken from the scene of crime constitutes as a very important supplementary aids for crime detection and jurisprudence. They are permanent, unchangeable even after death and unique to each person. The main aim of this research is to find if there are any correlation between the occurrence of Lip prints and Palatal Rugae with Gender. Positive identification of a living or a deceased person using distinctive traits is a cornerstone of forensic science. This requires a combination of different procedures. Correlating lip prints, and palatal rugae with gender may be valuable in forensic science in precise identification of an individual than by means of lip prints, or palatal rugae only. If any correlation can be established, it can create a new room in forensic odontology investigation.The aim of this study was to assess the correlation of Lip print patterns with Palatal Rugae patterns in Gender determination.

***Keywords**: Identification, rugae, lip prints*

I. Introduction:

Identity is a set of substantial distinctiveness, purposeful or psychic, usual or pathological, which describes an individual. Identification of a person is of paramount importance in a medico-legal investigation. It is based on scientific principles, largely involving dental records, fi ngerprints and DNA comparisons. At times, it becomes essential to apply slighter known and remarkable techniques like cheiloscopy and palatoscopy. Lip prints and palatal rugae patterns are found to be unique to the individual and therefore embrace the possibility for identifi cation.[1-3] Lip prints are common lines, fi ssures in the appearance of wrinkles and grooves seen in the zone of transition of lip in the middle of the inner labial mucosa and outer skin. Cheiloscopy (from the greek: Cheilos-“lips” and skopein-“to see”) is a given name to the lip pattern studies.[3] It is probable to identify that lip print patterns form as before 6th

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week of uterine life. Since that instant on, the lip patterns hardly ever modify, resisting many afflictions and therefore lip prints assist as a means in human identification. Yasuo Tsuchihashi considered the lip prints of 757 males and 607 females of Japanese subjects and classifi ed them into six types based on shape and way of the grooves.[1,4] Palatal rugae, in adding together are unique to an individual, protected from trauma by their internal location in the head. Once shaped, rugae do not go through any changes with the exception of length, due to regular growth, enduring in the same arrangement right through the complete person's life. Diseases, chemical violence or trauma do not appear to change the palatal rugae form.[5] The purpose of palatal rugae patterns intended for personal recognition was foremost suggested by Harrison Allen in 1889. Thomas and Kotze in 1983 detailed the various patterns of palatal rugae and classified based on the shape, unification, direction, and length.[6] In the literature, there is no data for the study finished to compare lip prints and palatal rugae with blood groups. Correlating lip prints and palatal rugae with blood groups may be valuable in forensic science in precise identify cation of an individual than by means of lip prints or palatal rugae only. The present study was carried out to establish the allocation of different lip print patterns and palatal rugae. In our study, we have also searched for the predominant lip print type and palatal rugae patterns.

II. Materials and Methods:

Subjects: The sample consisted of 25 females and 25 males in chennai, tamil nadu. Their palatal rugae impressions, and lip prints were taken.

Recording the lip prints Lips free from some pathology, having extremely normal transition zone linking the mucosa and the skin were incorporated in the study. Lips of the subjects were cleaned, and lipstick was applied all over the lips. Lip "impressions" were traced in the usual rest place of the lips by applying a ribbon of cellophane tape, that is 10 cm long. The cellophane strip was consequently fixed on to the white chart paper for everlasting documentation and then the recorded lip prints be visualized with a magnifying lens.

Examination of the lip prints:

Each individual's lips were divided into 4 compartments and seen for the type of lip print in each compartment [Figure 2]. Classification scheme as proposed by Tsuchihashi was used:[4,7]

Type 1: Clear-cut vertical grooves that run across the entire lips 2. Type 1: Similar to Type 1, but do not cover the entire lip 3. Type 2: Branched grooves 4. Type 3: Intersected grooves 5. Type 4: Reticular grooves 6. Type 5: Grooves do not fall into any of the above categories.

Recording the palatal rugae Alginate impressions of only maxillary arch were prepared and poured by means of dental stone. A dental plaster base was prepared, and casts were conserved for analysis. The rugae patterns were traced on these casts using a sharp graphite pencil below sufficientlight. The palatal rugae patterns were subsequently explored on these casts with the facility of magnifying lens.

Examination of the palatal rugae:

Thomas and Kotze in 1983 classified a variety of patterns of primary rugae based on the shape, direction, and unification.[8] A. The shapes of individual rugae were categorized into four main types:

1. Curved: Crescent shaped and curved gently
2. Wavy: Slight curve at the origin or termination of curved rugae, it was classified as wavy
3. Straight: Ran directly from their origin to termination
4. Circular:

A. Formed from a definite continuous ring.

B. The direction of the rugae was determined by measuring the angle produced by the line joining its origin and termination and the line perpendicular to the median rugae:

1. Forwardly directed: Rugae associated with positive angles,
2. Backwardly directed: Rugae associated with negative angles.

C. Unification occurs when two rugae are joined at their origin or termination:

1. Diverging: Two rugae having the same origin, but immediately branched,
2. Converging: Rugae with differentorigins joined on their lateral portions.

III. Results:

Our observation revealed that the most common pattern of lip print was the reticular (type 4 pattern, 25 out of 50 subjects, 50%), followed by branched (type 2, 12 out of 50 subjects, 25%), complete vertical (type 1 pattern, 7 out of 50, 14.5%), incomplete vertical (type 1′, 2 out of 50 , 5.6%), and undetermined (type 5, 2 out of 50,, 5%). There was no intersected (type 3) pattern noted. The most common pattern of palatal rugae observed was wavy (31 out of 50 cases, 62.5%), followed by curved (22 out of 50 cases, 22.5%), straight (5 out of 50 cases, 10%), and undetermined (2out of 50cases, 5%). There were no circular types of rugae pattern in any of the study subjects.The correlation of lip prints, and palatal rugged patterns showed no statistical significance. Inter- Intra examiner error was found out to be non

significant with (p<.001). Correlation of reticular pattern (lip prints) and wavy pattern (palatal rugae) accounted for 47% of the cases (P = 0.3).

IV. Discussion:

In the absence of ante mortem data, identification is usually established by the testimony of eye witness. In view of forensic jurisprudence, detecting and identifying lip print at a site of calamity of any nature may prove to provide key evidence. External surface of the lip has many elevations and depressions forming a characteristic pattern called lip prints [1]. As it is genotypically determined, the importance of using it for forensic investigations is justified as the pattern never undergoes changes from birth until the body undergoes decomposition [2]. Moreover, it also gives an intuition into the type of the event, number of people involved, gender, cosmetics used, any habits, and pathological states associated with the lips [2]. With regard to the type of lip print from studies in Indian female population, a great degree of inconsistency is evident based on the previous study reports. The presence of complete vertical (type 1) and incomplete vertical (type 1') patterns has been reported [4, 5]. Contrary to these observations, Gondivkar et al. found a prevalence of branched pattern (type 2), [11, 12] while intersected and branched pattern (types 3 and 2, respectively) were the most predominant in a study reported by Saraswathi et al. [13] Similar distribution pattern is available in reports of Gopichand et al. and Domiaty et al., in which theInternational Journal of Applied Dental Sciences intersected (type 2) and the branched (type 3) were the most frequent patterns, respectively [1, 2]. Interestingly, our observation suggested that the reticular pattern was the most predominant (type 4 patterns, 16 out of 50subjects, 33.3%) and none of the subjects presented with intersected pattern (type 3). The varied presentation of lip prints is perhaps due to difference in sampling methods and inclusion of diverse population groups with varied ethnicity. Nevertheless, this unpredictability in outcome may prove to be ideal for forensic investigation as the likelihood of uniqueness of pattern in individual is higher.

V. Conclusion:

Although an extensive scientific research on the study of the lip prints, palatal rugae, is available, the study comparing and correlating these two variables is minimal. A forensic bank has to be developed worldwide in order to store all these evidences, thereby developing a cohesive system. Our attempt was to initiate the process at the regional level, which if continued further will allow secure and faster identification with these supplemental evidences. Therefore, patterns definitely act as aids in population sub typing because lip prints speak the untold, rugae see the unseen, and together they might help in arriving at a conclusion.

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