



Research Article

PERSONAL IDENTIFICATION USING THUMBPRINTS

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ABSTRACT

Identifying an individual alive or dead using certain unique characteristics forms the basis of forensic sciences. Fingerprint identification is one such parameter which can be used for this. It is one of the first simple identification tools before using complex techniques like DNA analysis. Identification of sex has a vital role in medico legal investigations. Aim: To determine the distribution of different thumb print patterns in the individuals. Material and method: study was conducted on 100 individuals (50 males and 50 females) based upon inclusion and exclusion criteria and thumb print was made using blue ink, whatman filter paper and cellophane tape and it was analysed using magnifying lens. Statistical analysis was done using Chi square test. Result and conclusion: loop finger prints were more common followed by whorl and arch. They are unique to individual and are affected by genetic and environmental influences.

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INTRODUCTION

Dental profession is not just limited to examination, diagnosis and treatment of oral and orofacial structures but also to provide service in other community and legal matters. [1] Dentist has a key role in personal identification due to distinctive features of teeth, lips and palate. Apart from this, second prints of interest, which are extremely peculiar and form the basis for individual recognition in forensic are Fingerprints. [2] Every human being possesses a distinctive set of tiny raised ridges on volar pads called "friction ridge skin." A fingerprint is the depiction of the epidermis of a finger. These clear and unique outlines of the crease are called fingerprints. [3] Fingerprints do not change throughout life unless damage has occurred.

With growth palm size also increases and fingerprint increases in size without any new ridges. Ridge breadth is the measurement from the center of one furrow across the ridge to the center of the next furrow. [2] Hence, no two fingers will have identical fingerprints not even twins who share the same DNA profile. Probability of two individuals having identical finger prints is about one in sixty-four thousand million of the world population. [4]

Due to the huge probability of fingerprints as an effective method of detection an attempt is made to evaluate the role of thumb prints in identification of gender and individual.

MATERIAL AND METHOD

After obtaining the ethical approval from the institution and consent from the subjects, the study was conducted on 100 individuals (50 males and 50 females).

Inclusion criteria

1. Subjects in age group of 18-45 years were included in study
2. Subjects without any injury or damage to the thumb
3. Subject without any thumb deformity
4. Subjects who were willing to participate with consent

Exclusion criteria

1. Subjects with disfigured thumb
2. Subjects with burn injuries on thumb
3. Subjects who were not willing to participate
4. Subjects who denied consent

Procedure

Blue ink fingerprint pad, Whatman filter paper, cellophane tape and magnifying lens were needed for recording fingerprints. The thumb of right hand was cleaned and immersed in ink and impression was made on Whatman's filter paper and print patterns were observed. Right hand was chosen as mostly it is the working hand and thumb was selected for study as it has a better surface area available due

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to bigger size compared to rest of fingers. The thumb prints were analysed and categorized as per Michael Kucken classification system as 1. Loop 2. Whorl 3. Arch.

RESULTS

Statistical analysis was done using Chi square test. Loop fingerprints were most common in both genders (56%) followed by whorl and arch (34% and 10%). [Table 1] Among the females, Whorl prints were common (52.6%) followed by loop and arch (40%, 8.2%). Arch fingerprint was predominantly present in males (56%). [Table 2a and 2b] Since males have larger body surface area than females, ridge density in males was lower. Females have finer and sharper dermal ridges.

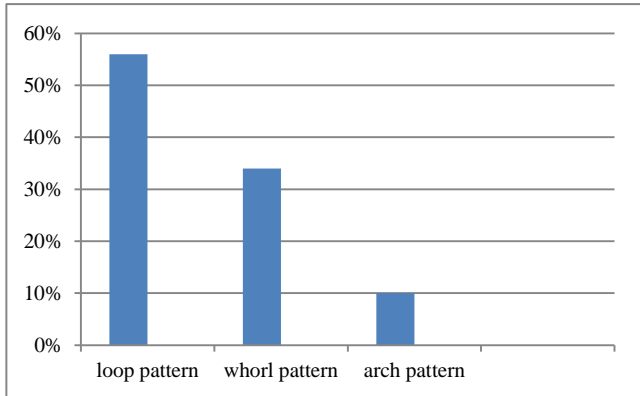


Table 1 Common thumbprint pattern

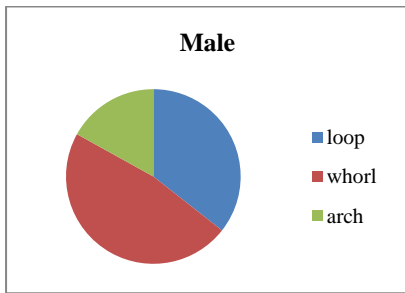


Table 2a Male thumb print pattern

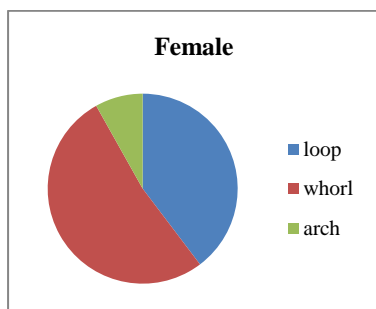


Table 2b Female thumb print pattern

DISCUSSION

Individual identification has an essential role in crime investigation. Various recognized methods have been utilized in the identifying a person. In order to accurately identify a person, the relation of two variables in forensic is of prime importance as it can be additional means used with the usual techniques. [4] Concept of uniqueness is a strong point to prove to the court of law.

The fingerprint examination for identification dates back to prehistoric times. Individual fingerprints have been used as one of the vital parts of identification in both civil and criminal cases, because of their unique properties of absolute identity. [5] No two fingers have identical prints, and never will they be found to match. The ridge patterns are created intrauterine and remain the same throughout life and even after death until decomposed. [6] Fingerprints are important because unlike most individual traits; dermal folds and the pattern formed are not affected by age. The comprehensive structure of person’s ridges is variable, and is not affected by environment postnatally. [7]

Our observation showed loop pattern is the commonest, followed by whorl pattern and arch pattern, similar to many other studies. The ridge density was higher in females which was similar to other previous studies.

CONCLUSION

Fingerprints are one of the dermatoglyphic traits for individual identification. The formation of the ridges is guided by genes and the environment (amniotic fluids) of the embryo during first month intrauterine.

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