

## Dermatoglyphics – palm printing

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### ABSTRACT

**Introduction:** Dermatoglyphics, in general, is the study of ridged skin on palms. A palm print refers to an image acquired of the palm region of the hand. It contains information such as texture, idents, and marks that are used for criminal, forensic, and in many commercial applications. **Methods:** For the purpose of the study, randomly selected males and females of 25 were chosen. Palm prints were collected using blue ink on A4 size white paper for the study. By using corresponding parameter ridges were studied. **Results:** Dermatoglyphics of palm prints are different from one individual to other. Not our left and right palm prints are same. **Conclusion:** This study will give us the significant results of the identity of each individual. Dermatoglyphics gives us a clear proof in forensics, anatomy forensics, and many criminal cases. It also helps in making our study easy and proves that each individual has unique palm prints.

**KEY WORDS:** Congenital disease, Dermatoglyphic pattern, Finger print

### INTRODUCTION

Dermatoglyphics, in general, is the study of ridged skin on palms. It is mainly used in chromosomal investigations and identifying many congenital diseases. Analysis of dermatoglyphics involves either qualitative methods based on the formation of patterns of ridges or quantitatively by counting the number of ridges within the palm print. Dermatoglyphics is used in investing effects of any prenatal factors.<sup>[1]</sup> The palm as itself consists of principle ridges, wrinkles, and epidermal ridges. A palm print is an image acquired of the palm ridges of the hand.<sup>[2]</sup> Palm prints are very commonly used in criminology, forensic, or any other commercial applications. Palm prints are often found in crime scenes which is one of the main reports for our evidence.<sup>[3]</sup> Dermatoglyphics refers the making of naturally occurring on certain body parts, namely the palms, fingers, soles, and toes. These are area where hairs commonly do not grow.<sup>[4]</sup> Dermatoglyphics when correlated with genetic abnormalities aids of congenital malformations at birth or soon after birth.<sup>[5]</sup> The configuration of dermal ridges has greater direct consequences in the feral topography on the hand during

their perinatal life between 13 and 19 weeks where it is transverse lines in growth. As dermatoglyphics is not determined genetically but can have indirect in the early fetal hand.<sup>[6]</sup> Dermatoglyphic patterns configuration which relates both the old and young palm prints, toe prints, and fingerprints. More than for 1000 years, Chinese used palm prints for several study. More than fingerprints, palm prints give us information and in understanding many studies more easily.<sup>[7]</sup> As said more than 150 years, dermatoglyphics is not only widely used in personal identification of each and every individual but also used as an important tool in understanding us the many basic questions in biology, genetics, evolution, and medicine. It is a preliminary tool in conditioning and suspected genetic bases.<sup>[8]</sup>

### METHODS

For the purpose of the study, randomly selected males and females of 25 were chosen. Palm prints were collected using blue ink on A4 size white paper for the study. By using corresponding parameter ridges that included upper right, upper left, lower right, and lower left, and also, major crease and minor crease were also taken for each individual. These four corners were plotted with a measurement of 1 mm on a cellophane tape placed over a magnifying 10X glass to view the ridges on that palm more accurately and to count them.

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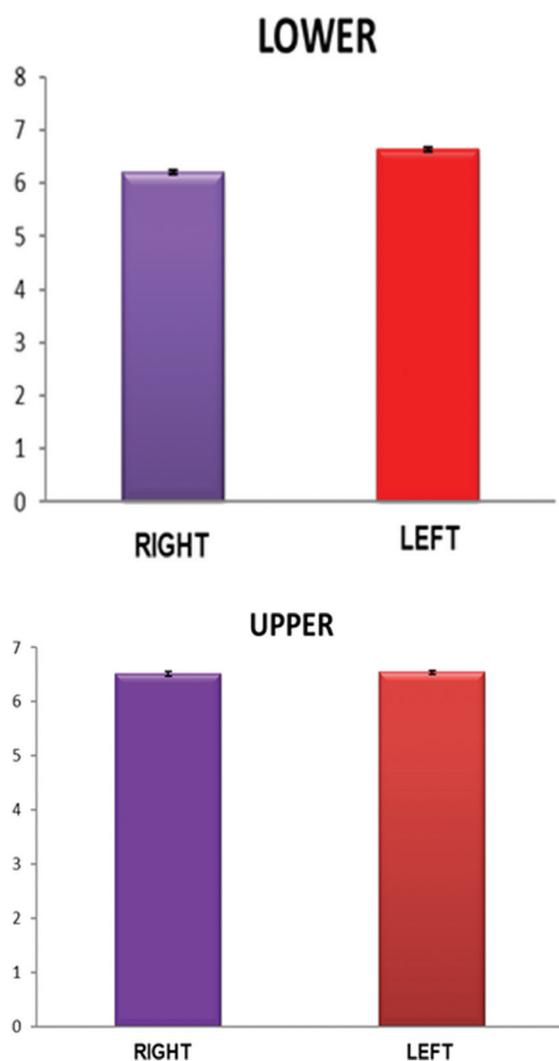
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## RESULTS

The result is not statistically significant at  $P < 0.05$ . The dermatoglyphic studies of palm prints are different from one individual to other and it is unique to all. Not our left and right palm prints are same. The uniqueness of palm prints and fingerprints are because it is the reflection of each ones DNA on their prints, and hence, it does not change for anyone. There are so many genetic diseases associated and which can be identified through dermatoglyphics as it is more related to it.



## DISCUSSION

Dermatoglyphics has so many useful features in it which is helping in people's day-to-day life. It is used in forensics, identifying many criminal cases. Each individual has unique patterns of palm prints. As many previous studies have proved and said that dermatoglyphics may it be fingerprints, palm prints, or toe prints anything it's different for each and every individual as it never changes from the time born

till death unless and until there is a serious injury or damage that affects the tissue or the patterning goes away in such extreme cases. In this study, as both males and females palm print were taken and studied, it gives a clear view that males had very little increase in number of ridges or crease when compared with females. Dermatoglyphics has reached out people in many useful ways where technology has made its way easier and more accessible to people. In today's recent world, biometric has gained more attention in security need when dermatoglyphics plays a very major role. This study on palm printing is just yet another property which is proving in this field of technology.<sup>[9]</sup> Biometrics are used in personal authentication system in many ways. Digital password or passcodes are now being replaced by biometrics in recent years as it is more easily accessible based on technology. Fingerprints and palm prints from this study are used for accessibility in college, office, hospitals, and many places to restrict the entry of unwanted or other peoples entry.<sup>[10]</sup> As we know, there are so many different types of prints for personal authentication which is being used in different fields. Palm prints are one most best representation for its reliable authentication systems. The widespread of technology in our society has made us understand and proved that palm prints are more friendly in personal authentication in biometric study.<sup>[11]</sup> Dermatoglyphics will never change for an individual unless serious injury to the dermis. Dermatoglyphics is unique for each and every individual as it is the reflection of DNA, and hence, it never changes for us.<sup>[12]</sup> Dermatoglyphics here is palm prints, and the two areas in our body are the palm and sole that are covered by very distinct layers or covering of marks fully that is not same and it differs from our right palm to left palm and everything. As very interesting fact is that so many genetic diseases are related directly or indirectly to palm prints.<sup>[13]</sup> Recently, it is found that dermatoglyphics is being widely now used in dentistry to detect so many conditions such as cleft lip and palate, early childhood caries, developing malocclusion in pediatric population, periodontal diseases, bruxism, and malignant conditions which are genetic basis naturally. The main reason is that dermatoglyphics remains unchanged from the time of birth or even before when we are in the womb till the time we die and even after death, it remains unchanged.<sup>[14]</sup> Dermatoglyphics can be used to identify the sex-linked genes, many heritability genes responsible for various issues. It is also used to identify the possible of the inheritance of some of the elements patterns.<sup>[15]</sup> Computer-based identification is commonly called as biometrics which is commonly used worldwide biometric is increasingly being used as so many negative people so biometric is kept which allows only desired people accessibility.<sup>[16]</sup> As many organs ridge on the skin also develop little early in

the fetal development which is very commonly determined by morphological events during their embryonic developments, and in this study, it is clearly said that palm printing is unique for each and every individual.<sup>[17]</sup>

## CONCLUSION

This study will give us the significant results of identity of each individual. Dermatoglyphics gives us a clear proof in forensics, anatomy forensics, and many criminal cases. Dermatoglyphics plays a major role in security need everywhere and is gaining more awareness as it holds many confidential things locked with fingerprints or palm prints enabling to access it. It also helps in making our study easy and proves that each individual has unique palm prints. Dermatoglyphics is very useful in developing year and technology as it helps in hand and hand with technology to find our so many diseases, reports clinically, giving more specified view in the department of forensic. Dermatoglyphics stays an important tool or evidence in forensics as it does not change even after the death of an individual.

## REFERENCES

- Mellor CS. Dermatoglyphic evidence of fluctuating asymmetry in schizophrenia. *Br J Psychiatry* 1992;160:467-72.
- Zhang D. *Palmpoint Authentication*. Norwell, Mass: Kluwer Academic Publishers; 2004.
- Fisher BA. *Techniques of Crime Scene Investigation*. Boca Raton: CRC Press; 2004.
- National Academy of Sciences. *Strengthening Forensic Science: A Path Forward*. National Academy of Sciences; 2016.
- Komatz Y, Yoshida O. Finger patterns and ridge counts of patients with Klinefelter's syndrome (47, XXY) among the Japanese. *Hum Hered* 1976;26:290-7.
- Mulvihill JJ, Smith DW. The genesis of dermatoglyphics. *J Pediatr* 1969;75:579-89.
- Zhou Y, Zeng Y, Lizhen, Hu W. Application and development of palm print research. *Technol Health Care* 2002;10:383-90.
- Ramani P, Abhilash PR, Sherlin HJ, Anuja N, Premkumar P, Chandrasekar T, *et al.* Conventional dermatoglyphics – Revived concept: A review. *Int J Pharm Bio Sci* 2011;2:446-58.
- Connie T, Teoh A, Goh M, Ngo D. *Palmpoint Recognition with PCA and ICA*. Faculty of Information Sciences and Technology, Multimedia University, Melaka, Malaysi; 2003. p. 227-32.
- Hana CC, Chengb HL, Linb CL, Fanb KC. Personal authentication using palm-print features. *Pattern Recognit* 2000;36:371-81.
- Kumara A, Zhang D. Personal authentication using multiple palmpoint representation. *J Patter Recognit* 2005;38:1695-704.
- Prabha L, Thenmozhi R. A short review on dermatoglyphics. *J Pharm Sci Res* 2014;6:200-2.
- Chandrasekaran S, Chellammal R, Ganapathy DM. Dermatoglyphics- A tool in dentistry. *J Adv Pharm Educ Res* 2017;7:249-52.
- Patil PB, Reddy JJ, Joshi V, Kiran Kumar KR, Shilpa RT, Satyanarayana P. Dermatoglyphics in patients with oral potentially malignant diseases and oral cancer. *J Indian Acad Oral Med Radiol* 2017;29:191-4.
- Loesch D. Genetics of dermatoglyphic patterns on palms. *Ann Hum Genet* 1971;34:277-90.
- Li W, Zhang D, Xu Z. Palmpoint identification by Fourier transforms. *Int J Pattern Recognit Artif Intell* 2002;16:417-32.
- Miller JR. Dermatoglyphics. *J Investig Dermatoglyphics* 1973;60:435-42.

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