

STUDY ON DERMATOGLYPHIC PATTERNS OF TWINS

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Abstract: Dermatoglyphics (from ancient Greek derma=skin, glyph=carving) is the scientific study of fingerprints. The ridges and groves on palms and soles are under the influence of genes and are unique. Twins share most of the features but for the dermatoglyphics. The aim of the present study is to determine the dermatoglyphic patterns in twins-both monozygotic and dizygotic. The patterns of fingerprints were analysed from the images captured after taking an informed verbal consent from 3 pairs of twins. 2 pairs were dizygotic twins (one pair females& other males) and 1 pair was monozygotic twins (females) and the results were as follows: 1st pair-: The patterns of left hand didn't match at all but three fingers of the right hand of the same showed similar patterns. 2nd pair-: The dermatoglyphics of two fingers of the right hand and three digits of the left hand were the same. Patterns of the remaining digits were not identical. 3rd pair-: The evaluation of dizygotic males depicted same pattern of two digits of left hand but none of the digits of the right hand were identical. The present study showed that the patterns were identical on few digits and the remaining was different. This study can be further enhanced by evaluating on more number of twins.

Key Words: Dermatoglyphics, twins, monozygotic, dizygotic.

INTRODUCTION:

Dermatoglyphics, the study of fingerprints, was first reported in 1684^[1]. Fingerprint identification is called dactyloscopy^[2]. A friction ridge is a raised portion of the epidermis on the digits (fingers and toes), The crucial events for the establishment of the epidermal ridge pattern take place from the 10th to the 16th week of pregnancy¹. Because fingerprint patterns are encoded at the interface between dermis and epidermis the pattern cannot be destroyed by superficial skin injuries^[3]. There are marked differences in the variability of dermatoglyphic patterns within dizygotic (DZ) and monozygotic (MZ) twins, and dermatoglyphic patterns may be used to help discriminate MZ and DZ twins. The present study aims at the variations of fingerprint patterns in twins- both monozygotic and dizygotic.

MATERIALS AND METHODS:

Verbal consent was taken from the monozygotic and dizygotic pairs of twins. Images of the hands were captured from mobile with flash and the dermatoglyphic patterns of each finger were studied. The results were tabulated and analyzed.

DISCUSSION:

Finger prints can be broadly classified into 3 types-loop, whorl and arch^[4]. They are the marks of identification that are genetically determined and last forever. A study by Reed et al^[5] shows that different influences affect dermatoglyphic pattern development in twins. Blumer and Michael^[6,7] described the formation of fingerprints in their reports. Not much literature was available on the study of fingerprint patterns on large number of twins and of various varieties. The present study describes the various patterns of fingerprints in 3 sets of twins. Though monozygotic, the patterns of left hand didn't match at all in one pair. In the dizygotic pair, fingerprints of few digits of both hands were similar but there was a gender difference. The fingerprints of the right hands of dizygotic males were entirely different from each other. This shows that there is a wide variation in the patterns of the twins, be it monozygotic or dizygotic.

RESULTS:

Table 1: Dermatoglyphic patterns of 1st pair-monozygotic twins; both females

SNo.	Twin	Right hand	Left hand
1.	1	Thumb -radial loop	Thumb -radial loop
2.		Index finger -arch	Index finger -arch
3.		Middle finger –tented arch	Middle finger -arch
4.		Ring finger -tented arch	Ring finger -tented arch
5.		Little finger -tented arch	Little finger -radial loop
6.	2	Thumb -tented arch	Thumb -ulnar loop
7.		Index finger -arch	Index finger -ulnar loop
8.		Middle finger –ulnar loop	Middle finger -tented arch
9.		Ring finger -tented arch	Ring finger -radial loop
10.		Little finger -tented arch	Little finger -arch

Table 2: Dermatoglyphic patterns of 2nd pair-dizygotic twins; both females

SNo.	Twin	Right hand	Left hand
1.	1	Thumb -arch	Thumb -tented arch
2.		Index finger -ulnar loop	Index finger -ulnar loop
3.		Middle finger –ulnar loop	Middle finger -ulnar loop
4.		Ring finger -whorl	Ring finger -whorl
5.		Little finger -ulnar loop	Little finger -ulnar loop
6.	2	Thumb -tented arch	Thumb -whorl
7.		Index finger -whorl	Index finger -whorl
8.		Middle finger –ulnar loop	Middle finger -ulnar loop
9.		Ring finger -ulnar loop	Ring finger -whorl
10.		Little finger -ulnar loop	Little finger -ulnar loop

Table 3: Dermatoglyphic patterns of 3rd pair-dizygotic twins; both males

SNo.	Twin	Right hand	Left hand
1.	1	Thumb -ulnar loop	Thumb -whorl
2.		Index finger -whorl	Index finger -whorl
3.		Middle finger –whorl	Middle finger -ulnar loop
4.		Ring finger -ulnar loop	Ring finger -whorl
5.		Little finger -tented arch	Little finger -ulnar loop
6.	2	Thumb -whorl	Thumb -ulnar loop
7.		Index finger -ulnar loop	Index finger -arch
8.		Middle finger –ulnar loop	Middle finger -ulnar loop
9.		Ring finger -whorl	Ring finger -whorl
10.		Little finger -tented arch	Little finger -tented arch

Graph 1: similar patterns of fingerprints among the twins

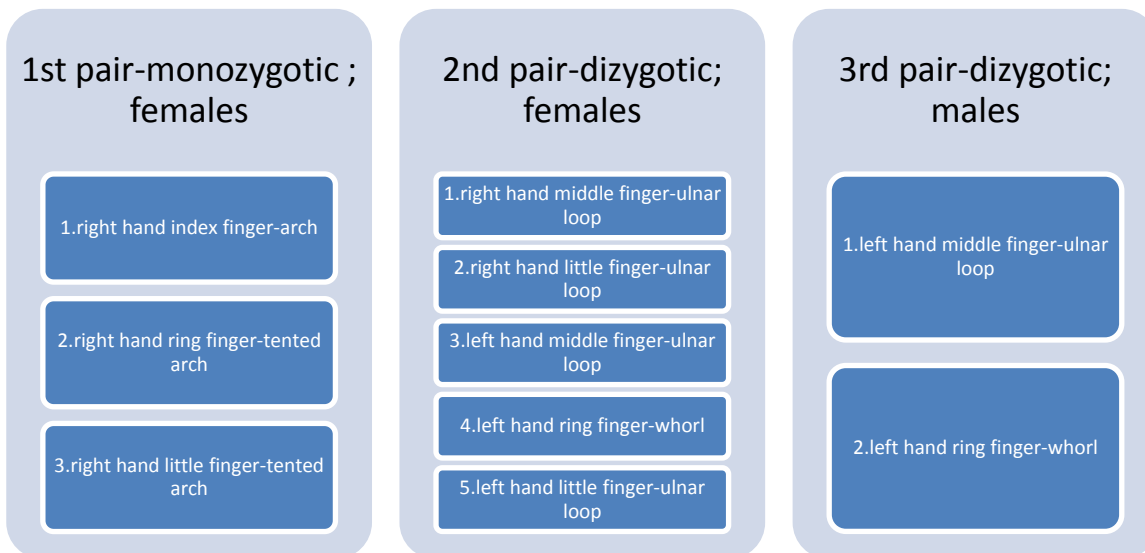


Figure-1: finger prints of 1st pair-monozygotic; females

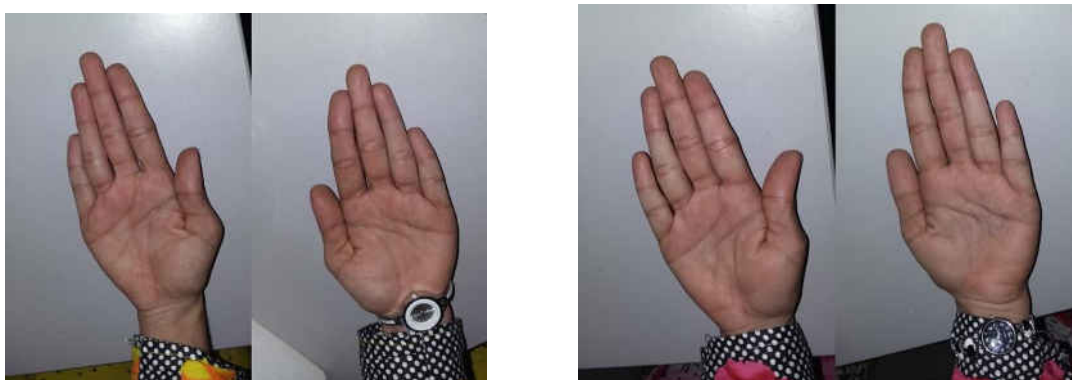


Figure 2: finger prints of 2nd pair- dizygotic; females

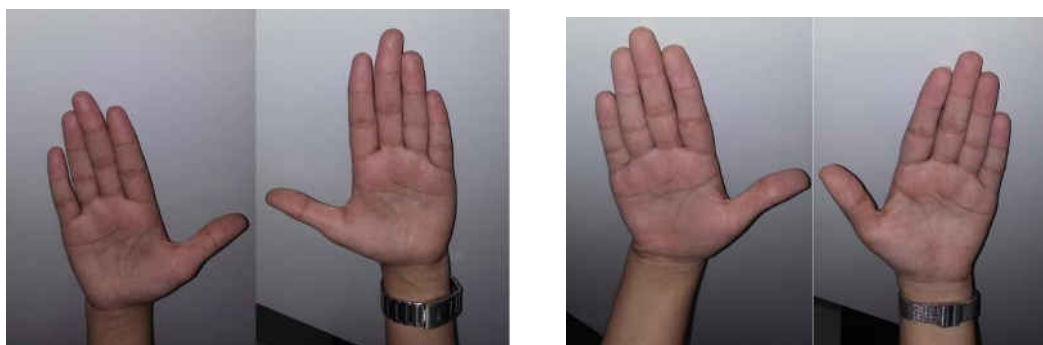
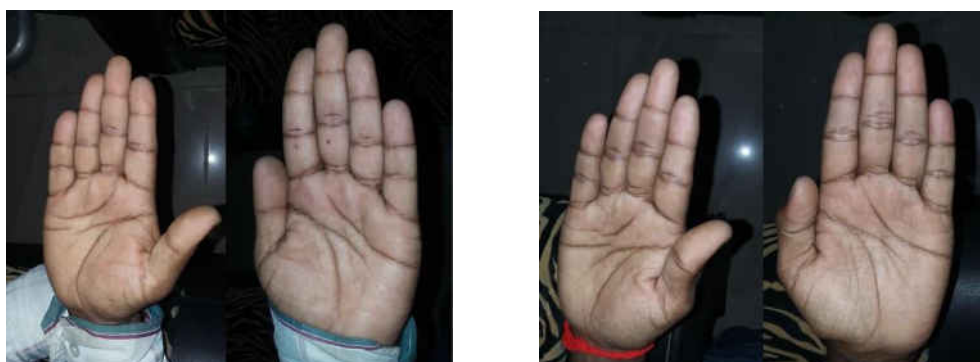


Fig 3: finger prints of 3rd pair-dizygotic ; males



- The patterns of left hand of the monozygotic females didn't match at all but three fingers of the right hand of the same showed similar patterns.
- When the dizygotic female group was compared, the dermatoglyphics of two fingers of the right hand and three digits of the left hand were the same.
- The evaluation of dizygotic males depicted same pattern of two digits of left hand but none of the digits of the right hand were identical.

CONCLUSION:

The dermatoglyphics of twins differ widely. The difference is marked even in monozygotic twins. Dermatoglyphics, thus is unique for an individual; twins are no bar, even monozygotic. The study can further be evaluated on more number of pairs to draw finer conclusions.

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