FINGERPRINTING IN HANDBALL SELECTION AND ORIENTATION

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Abstract: *Skin marks or a fingerprint represents today, the study object for different categories of scientists, including medical genetics and sports. The sports profile based on the fingerprints can lead towards the selection and orientation in handball. The aim of this study is to show that the characteristics of the fingerprints show us what dominant physical quality one has, how many symbols a player has and how that helps into relation with handball playing. The fingerprint characteristics bring us closer into knowing the most developed physical quality. It can ease the selection and orientation process into finding children with true abilities for handball.*

Key words: *fingerprint, handball, selection.*

1. Introduction

Before the scientific interest for fingerprints, human attention was directed toward those digital signs – here we refer to fingerprints, which we can find from prehistoric times in caves or on human objects with the purpose of identifying personal belongings.

In recent past, digital fingerprints were used by illiterates with the purpose of substituting their signature.

In some countries, the papillary relief helps in predicting the future or just trying to guess something about it, and even in practicing palmistry.

The term of digital fingerprint was proposed for the first time by Cummins and Mildo in 1926 in the first human anatomy book that described dermic reliefs, and has won the 42-nd Annual Session of American Association in April 1926 [13].

Skin engravings or dermatoglyphics represents today, the study object for different categories of sciences: anatomy, genetics, anthropology, medicine and not the least medical genetics and sports.

The most popular domain in which fingerprinting it's used is the criminalistic one. This practice is the most common and used for persons identification based on two fingerprints aspects: unicity and their persistence through time.

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An athlete's profile from dermatoglyphics point of view can detect one's talent, but even more it can help in selection and orientation.

Matveev (1997) considers that motor qualities depend to a large extend on heredity, and so, athletes and their potential could result from knowing their individual potential.

Fingerprints represent genetic universal marks that appears from the 6-th month of intrauterine life and remain unchanged throughout the life, with the exception of the cases where derma it's destroyed irremediably from injuries. Papillary drawings have a stable number – it doesn't appear or disappear in time, with the same form and place. Those are formed from multiple lines of papillary growths and remain the same, with the exception that it grows in size.

Every individual has a unique fingerprint, even the twins. Although there are not two identical or related fingerprints, some papillary drawings form models that can be found at family members or ethnic groups.

2. Method

The fingerprinting method it's one of the detection form of the possibilities and characteristics of an athlete, his propensity towards endurance, speed, strength, coordination or mobility.

For sampling we need a sampling kit formed from:
- Black typographic ink.
- Application roller.
- Magnifier glass.
- Wet and dry napkins.

To have a qualitative sampling we need to respect some rules, among which we remind:

The black ink has to be distributed evenly on the surface of the fingers.

The fingerprints must be placed vertically on the special paper [15].

Right after the sampling we can start the interpretation. During the analysis routine, the specialists establish if it's enough information in order to find the papillary drawing type.
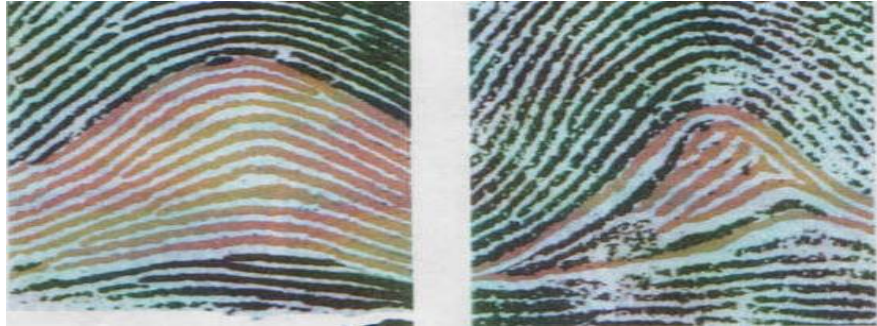
3. Papillary Drawing Type

A fingerprint pattern, the mark left after the finger print, on which we applied black ink according to the fingerprinting technique, on paper, it's represented by rubbing of the papillary ridges of the certain finger.

Papillary ridges are the consequence of a skin modification. It presents usually like curved lines on the whole surface of the palms, but only to the finger extremities those lines form particular drawings, so on the intersection it appears a delta sign (Δ).

Through fingerprinting, in this case we mean the identification and classification of the drawings from the finger surface, according to the shape and the relationship between papillary ridges [8, 9], [12].

Arc type (A) – it's the least common drawing in about 5% of the cases, and it has the most simple form made only from papillary ridges light and strong curved.

This type of drawing presents no deltas and it's composed of lines that cross the fingerprint without intersecting one with another.

Fig. 1. *Papillary drawing arc type*

Loop type (L) – It's the most common type, met in approximate 70% of the cases. Here we can distinguish with ease the three regions of the drawing: the marginal zone, central and base zone. The intersection points of those zones form a delta sign. At their turn loop type drawings are classified depending on the position of the delta sign.

• Ulnar loop – this drawing has the delta sign at the left of the finger.

Fig. 2. *Ulnar loop drawing type*

• Radial loop – the delta sign for this type it's positioned on the right part of the fingerprint.
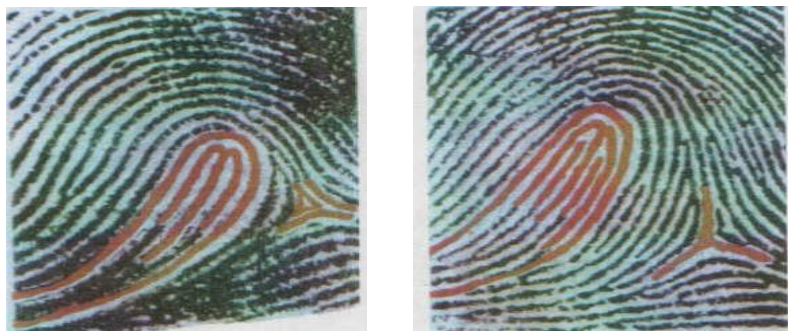
Fig. 3. *Radial loop drawing type*

Whorl type (W) – it's easy to identify because of the papillary ridges that are distributed under a circle form. Those ridges form two delta signs where the intersection point meets the starting point. At this drawing the central region is represented by a closed design, due to the concentric ridges.

Fig. 4. *Whorl drawing type*

4. Discussion

According to the researches made by scientists (Abramova, Ozolin, Nikitina, Filho, Dantas, etc.) for every papillary drawing it corresponds one or more motor qualities:

For A type it's attributed the strength capacity.

For L type it's attributed the speed capacity.

For W type it's attributed the coordination capacity.

Also a very important conclusion is represented by the knowing of the total number of delta signs for all ten fingers.

The higher the numbers of delta signs, the subjects are capable of resolving specific tasks and performing in team sports, including handball.

The total number of deltas can be found by applying the formula:

$\sum L + 2 \times \sum W = \Delta 10$,

Where,

A type = 0 deltas;

L type = 1 delta

W type = 2 deltas.

The total number can vary from 0 to 20, in other words from a simple design to the most complex one (Junior A.T.C., Cunha A.C.P.T., Schneider A T., Dantas P.M.S., 2006).

Except from the formula for finding the total number of deltas, there are used several types of formulas for observing the characteristics of the entire group:

• AL – with the presence of A and L drawings in any combination.

• ALW - with the presence of A, L, W signs in any combination.

• 10L – with the presence of L type sign only.

• LW – it only presents L and W signs, complex ones, but with the condition that L≥5.

WL - it only presents L and W signs, but the number of W sign must be bigger than 5. [14].

This shows us that the athletes that have in the fingerprint composition complex signs (L and W, and a lower number of A type drawing) can be oriented towards handball.

The endurance capacity, in the opinion of those specialists, has an intermediate level, which means that is presented at athletes with a medium number of existing deltas.

In handball after the process of selection we can orientate the players according to their fingerprint designs. The ones with the A type signs are the players that need strength first of all (the backs and the player from the pivot position), the ones with the L type predomination are the players that need speed in resolving the

game tasks (wings, goalkeepers) and the W type it is common to be met at players that play center back because it is linked to the coordination capacity.

5. **Conclusion**

Athletes in handball have different characteristics that can be used in the process of selection.

The application of the fingerprinting technique in order to find children suitable for handball using the formulas presented in order to identify the motor qualities that they are born with and identifying the ones that need to be developed through training, based on the fact that dermatoglyphic characteristics are genetic marks is a reliable criteria.

Besides that, the analysis of the fingerprint patterns is easy to read, it doesn't require expensive equipment and is not time consuming.

Another strength of this criteria is that we can orientate the athletes on playing positions according to their dermatoglyphic pattern.

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