

A DERMATOGLYPHICS OF FOOT IN THE PROGNOSIS OF SPORTING GIFT: DIFFERENTIAL DISTINCTIONS OF DERMATOGLYPHICS OF FOOT FOR SPORTSMEN AND PEOPLE WHICH DO NOT GO IN FOR SPORTS

Serhiyenko L.P., Lyshevska V.M.

Mykolaii inter regional institute of human's development
Kherson state agrarian university

Annotation. The features of forming of dermatoglyphics of feet are compared for sportsmen and people, which do not go in for sports. In researches took part 209 men and 198 women in age 17-19 years, which did not go in for systematic sports. The quantitative and high-quality indexes of dermatoglyphics of fingers and soles of foot were determined on a method T.D. Gladkova. It is certain that as genetic markers of propensity to the sporting gift there can be more difficult dermatoglyphics patterns (W) on the first finger and soles of feet and more considerable indexes of comb-shaped count on the first tiptoes. A dermatoglyphics of fingers and hands of hands is more informing in a prognosis high motive gift, than dermatoglyphics of feet. It can be predefined that is analysed greater amount of indexes of dermatoglyphics of hands as compared to feet. Probability of genetic prognosis is more high for girls, what for boys.

Keywords: dermatoglyphics, feet, genetic, markers, sporting, gift.

Introduction

Early prognostication of sports gifts of children is possible with using of genetic markers [7]. Groups of blood, peculiarities of constitution and iris color, morphological characteristics of arm structure, dermatoglyphics and so on – all these are reliable external genetic markers.

Genetic marking can be explained by the fact that gene, which codes certain feature and manifests on biochemical level sometimes is closely linked with other gene-marker (i.e. is located closely to other gene in one and the same chromosome), which forms external, easily visible feature. With genes linking the features, controlled by them, have trend to be inherited together. Thus, one of the signs, which can be easily determined at phenotype, is marker (indicator, which permits to prognosticate the level of development) of other. With revealing of sign-marker it is possible to judge not only about the presence but also about the absence of the researched morphological feature or motion ability's development of a person [4].

Study of genetic markers has started since 70-th years of the last century. The data were accumulated, mainly, owing to such researches as V.O. Nikitiuk and T.F. Abramova with disciples in Russia and L.P. Sergiyenko with disciples in Ukraine. But this problem requires further studying. That is why application of dermatoglyphic foot markers for prognostication of sports gifts is rather urgent subject.

Research of this problem, mainly, dealt with studying of associative connections between hand dermatoglyphics (hands, fingers) and high motion abilities' development level, or determining of bents to certain kinds of sports. In this way, we [5] studied finger dermatoglyphics for determination of coordination abilities; A.G. Arutiunyan [2] studied dermatoglyphic markers of children's speed power. B.O. Nykitiuk, V.I. Filipov [3] studied development of anaerobic abilities of 13-15 years old children, by indicators of 60 meters run. T.F. Abramova [1], studied hand dermatoglyphics of track and field sportsmen, and L.P. Sergiyenko, Ye. A. Strykalenko [6] studied rowers. Though, no publications about determination of foot dermatoglyphic markers for prognostication of children's motion abilities, are known to us.

The work has been fulfilled as per plan of scientific and research of Kherson state agrarian university.

Purpose, tasks of the work, material and methods

The purpose of the research is determination of dermatoglyphic markers, which can be used for prognostication of bents to sports gifts development.

The tasks:

1. Determination of differences of sportsmen's foot dermatoglyphic and of people, who do no sports (general population).
2. To find dermatoglyphic markers, which prognosticate bents of children and teen-agers to sportsmanship of high level.

The methods and materials of the research. Quantitative and qualitative indicators of foot fingers were determined by T.D. Gladkova's method. The technology of footprints' obtaining and analysis of dermatoglyphic signs were described by us in previous works.

Organization of the research. 209 persons (male) and 198 women of 17-19 years old, who did not go in for sports systematically, took part in the research. They were the students of Ukrainian southern region (Kherson). Qualified sportsmen's foot dermatoglyphic was also studied. Among them there were 78 men and 25 women, who specialized in field and tracks sports, boat racing, martial arts and etc. Distribution of sportsmen by their sportsmanship is given in table 1.

Table 1

Sportsmanship of the researched sportsmen

Sex	Sportsmanship			Total
	HMS	Int.MS	MS	

male	4	12	62	78
female	1	6	18	25
total	5	18	80	103

Notes: HMS – Honored Master of sports; Int. MS – International Master of sports; MS – Master of sports.

MC –

Results of the research

Toe dermatoglyphics. Distribution of main types of dermatoglyphic figures on right and left toes and in total on both foets are given in table 2 (for men) and in table 3 (for women).

Table 2

Distribution of main types of toes' dermatoglyphic figures of sportsmen and men of general population

Groups of the researched	Dermatoglyphic figures' types of toe					
	A		L		W	
	Q-ty	%	Q-ty	%	Q-ty	%
Right foot						
Students	20	9,6	173	82,7	16	7,7
Sportsmen	4	5,1	67	85,9	7	9,0
Left foot						
Students	18	8,6	168	80,4	23	11,0
Sportsmen	3	3,8	66	84,6	9	11,5
Total for both feet						
Students	38	9,1	341	81,6	39	9,3
Sportsmen	7	4,5	133	85,3	16	10,3

Table 3

Distribution of main types of toes' dermatoglyphic figures of sportswome and women of general population

Groups of the researched	Dermatoglyphic figures' types of toe					
	A		L		W	
	Q-ty	%	Q-ty	%	Q-ty	%
Right foot						
Students	31	15,7	151	76,2	16	8,1
Sportsmen	2	8,0	20	80,0	3	12,0
Left foot						
Students	36	18,2	140	70,7	22	11,1
Sportswomen	2	8,0	19	76,0	4	16,0
Total for both feet						
	67	16,9	291	73,5	38	9,6
	4	8,0	39	78,0	7	14,0

Analyzing the data of both tables it should be noted that there is the same trend of dermatoglyphic curves' distribution, peculiar to man and women of general population and sportsmen. The greatest quantity of loops (L) is observed and the least quantity of curls (W) and arcs (A) are observed. Comparing of Dermatoglyphic figures' types of general population men and women and sportsmen showed the following differences: sportsmen have less arcs (men - by 4,6% and women - by 8,9%) the most frequent are loops (man - by 3,7% and women - by 4,5%) and curls (man - by 1,0% and women - by 4,4%). It permits to assume, that people (men and women) who have bent to sports activity, have also phenotypically formed more complex types of dermatoglyphic curves on toes, than people, who has no such bent. Considering also the fact that the women's mentioned dermatoglyphics' differences are more expressive than men's ones, in our opinion, genetic prognostication by this sign is more reliable for women than for men.

Quantitative indicators of delta figures on men's and women's toes of different population groups are given in table 4. In this table we see that concerning the quantity of delta figures there is no substantial differences between them.

Table 4

Quantitative indicators ($\bar{X} \pm m$) of dermatoglyphic deltas on men's and women's toes of general population and sportsmen

Sex	Population group	Right foot	Left foot	Total for both feet
Men	Students	0,96 ± 0,027	0,98 ± 0,026	1,94 ± 0,043
	Sportsmen	0,99 ± 0,035	1,05 ± 0,041	2,01 ± 0,062
Women	Students	0,91 ± 0,033	0,92 ± 0,037	1,83 ± 0,062
	Sportswomen	0,96 ± 0,091	1,04 ± 0,091	2,00 ± 0,163

The peculiarities of phenotypic manifestation of ridge indicators on sportsmen's and students' toes, who do not go in for sports systemically are given in table 5. The trend is as follows: both sportsmen and sportswomen have more ridges on toes, comparing with those, who do no sports. As per absolute indicators men have greater quantity of ridges

than women, though the differences between sportswomen and students are greater (by 5,04 ridges), Than men (by 2,9 ridges).

Table 5

Quantitative indicators ($\bar{X} \pm m$) of dermatoglyphic ridges on men's and women's toes of general population and

		<i>sportsmen</i>		
Sex	Population group	Right foot	Left foot	Total for both feet
Men	Students	13,00 ± 0,544	12,61 ± 0,523	25,60 ± 0,988
	Sportsmen	13,83 ± 0,722	15,04 ± 1,012	28,50 ± 1,468
Women	Students	10,91 ± 0,524	10,61 ± 0,567	21,52 ± 1,011
	Sportswomen	13,28 ± 1,613	13,28 ± 2,076	26,56 ± 3,509

Foot sole's dermatoglyphics. The differences between the quantity of foot sole's dermatoglyphic figures of sportsmen and persons, who do not go in for sports are insufficient (see table 6).

Practically the same trend (insufficient differences) are observed with comparing of foot dermatoglyphic deltas and ridges of general population persons and sportsmen (see table 7).

Table 6

Quantitative indicators ($\bar{X} \pm m$) of dermatoglyphic figures on men's and women's soles of general population and

		<i>sportsmen</i>		
Sex	Population group	Right foot	Left foot	Total for both feet
Men	Students	1,88 ± 0,064	1,72 ± 0,060	3,60 ± 0,110
	Sportsmen	1,58 ± 0,090	1,59 ± 0,084	3,17 ± 0,163
Women	Students	1,60 ± 0,053	1,54 ± 0,051	3,13 ± 0,090
	Sportswomen	1,60 ± 0,153	1,52 ± 0,165	3,12 ± 0,254

Table 7

Quantitative indicators ($\bar{X} \pm m$) of dermatoglyphic deltas and ridges on men's and women's soles of general

		<i>population and sportsmen</i>		
Sex	Population group	Foot		Total for both feet
		Right	Left	
Deltas				
Men	Students	2,11 ± 0,087	1,94 ± 0,089	4,05 ± 0,162
	Sportsmen	1,78 ± 0,137	1,78 ± 0,129	3,51 ± 0,250
Women	Students	1,85 ± 0,080	1,68 ± 0,081	3,53 ± 0,143
	Sportswomen	1,68 ± 0,214	1,68 ± 0,189	3,36 ± 0,351
Ridges				
Men	Students	44,40 ± 1,944	40,61 ± 1,927	85,01 ± 3,565
	Sportsmen	39,14 ± 2,906	39,05 ± 2,866	77,19 ± 5,278
Women	Students	37,26 ± 1,722	32,15 ± 1,543	69,41 ± 2,939
	Sportswomen	36,64 ± 4,186	36,92 ± 4,124	73,56 ± 7,306

Distribution of dermatoglyphic phenotypes of man and women, who do not go in for sports on both feet are given in table 8. The trend to greater dermatoglyphic phenotypes differences in both population groups is more expressive for women than for men. Besides, sportsmen (and sportswomen) have more often curls figures in combination with loops (WL).

The said above gives ground to consider, that dermatoglyphic markers of children's and teenagers' bent to sports gifts can be more complex dermatoglyphic figures on toes and soles. The talented (in sports) boys and girls have more expressive dermatoglyphic ridges on toes than the persons, who have no bent to sports activity. By our data genetic prognostication for girls shall be more reliable than for boys (inter-population differences are much less for girls than for boys).

Table 8

Distribution of foot sole dermatoglyphics for men and women of general population (GP) and sportsmen (S)

Sex	Population group	Foot dermatoglyphic phenotypes															
		ALW		LW		WL		SLSW		L		W		LA		AL	
		Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
M	GP	0	0	165	39,5	13	3,1	47	11,2	47	11,2	37	8,9	58	13,9	51	12,2

	S	0	0	50	32,1	13	8,3	14	9,0	21	13,5	13	8,3	25	16,0	20	12,8
W	GP	0	0	106	26,8	21	5,3	38	9,6	42	10,6	53	13,4	77	19,4	59	14,9
	S	8	16,0	6	12,0	15	30,0	3	6,0	4	8,0	6	12,0	6	12,0	2	4,0

Comparing probability of genetic prognostication of sports gifts by hand and foot dermatoglyphics [8], in our opinion, hand dermatoglyphics is more informative. It can be conditioned by the fact that there are analyzed more indicators of by hand dermatoglyphics, than of foot one.

Conclusions

1. Foot dermatoglyphics can be used as genetic marker of children's bents to sports.
2. Foot dermatoglyphics of girls are more informative for prognostication of bents to sports, than the boys' ones.
3. Hands and hand fingers dermatoglyphics are more informative for prognostication of high level motion abilities than foot dermatoglyphics.
4. It is purposeful to use foot and hands dermatoglyphics in complex of genetic prognostication of children's and teenagers' bents to sports.

The prospects of further researches. It is stipulated to carry out research of differences of foot dermatoglyphics' formation of sportsmen of different specializations.

References:

- 1 Abramova T. F. *Pal'cevaia dermatoglifika i fizicheskie sposobnosti* [Finger dermatoglyphics and physical abilities], Dokt. Diss., Moscow, 2003, 291 p.
- 2 Arutiunian A. G. Pal'cevyie dermatoglify kak sredstvo prognozirovaniia i otbora v sporte [Finger dermatoglify as a means of prediction and selection in sport]. *Geneticheskie markery v antropogenetike i medicine* [Genetic markers in anthropogenetics and medicine], Khmel'nickij, 1988, pp. 140–141.
- 3 Nikitiuk B. A., Filippov V. I. Pokazateli dermatoglifiki kak kriteriia otbora v sporte [Dermatoglyphics indicators as a selection criterion in the sport]. *Kriterii anatomo-antropologicheskogo kontroliia v sporte* [Criteria anatomic anthropological control in sport], Moscow, 1982, pp. 117-118.
- 4 Lil'in E. T., Bogomazov E. A., Gofman–Kadoshnikov P. B. *Medicinskaia genetika dlia vrachej* [Medical genetics for physicians], Moscow, Medicine, 1983, 144 p.
- 5 Sergienko L. P. *Aktual'nye problemy fizicheskoi kul'tury* [Issues of the day of physical culture], Rostov on Don, 1995, vol. 5, pp. 3–8.
- 6 Sergiienko L. P., Strikalenko I. A. *Osoblivosti dermatoglifiki ruk u grebciv ta stril'civ* [Features dermatoglyphics hands rowers and shooters], Sumy: SumDPU, 2005, pp. 413–420.
- 7 Sergiienko L. P. *Sportivna genetika* [Sport genetics], Ternopil, Educational book-Bogdan, 2009, 944 p.
- 8 Sergiienko L. P. *Dermatoglifika, zdorov'e, sport* [Dermatoglyphics, health, sports], Ternopil, Educational book-Bogdan, 2012, 272 p.
- 9 Harkin M.E. Editor's Introduction. *Reviews in Anthropology*. 2012, vol.41(4), pp. 213–216. doi:10.1080/00938157.2012.732487
- 10 Hawkinson C. H. Dermatoglyphics at your fingertips. *Reviews in Anthropology*, 1979, vol. 3(6), pp. 393–401.

Cite this article as: Serhiyenko L.P., Lyshevska V.M. A dermatoglyphics of foot in the prognosis of sporting gift: differential distinctions of dermatoglyphics of foot for sportsmen and people which do not go in for sports. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.2, pp. 66-69. doi:10.6084/m9.figshare.639192

Information about the authors

Serhiyenko L.P.: ctrelcova@mail.ru; Open International University of Human Development "Ukraine"; Boiler Room str. 2, Nikolaev, 54003, Ukraine.

Lyshevska V.M.: ctrelcova@mail.ru; Kherson State Agrarian University; Rosa Luxemburg str. 23, Kherson, 73006, Ukraine.

The electronic version of this article is the complete one and can be found online at: <http://www.sportpedagogy.org.ua/html/arhive-e.html>

Received: 12.01.2013

Published: 28.02.2013

This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited (<http://creativecommons.org/licenses/by/3.0/deed.en>).