

UDC 340.6 + 343

Kozan N.M., Kotsiubynska Yu.Z.

Sexual Dimorphism of Fingers Dermatoglyphic Parameters in Boiko Ethnic Group PopulationDepartment of Pathology and Forensic Medicine SHEI "Ivano-Frankivsk National Medical University", Ivano-Frankivsk, Ukraine
nmkozan@gmail.com

Abstract. The article presents the results of investigation dermatoglyphics hand finger male and female, belonging to Boiko ethnic group living in the Ivano-Frankivsk region. The aim of our research is the study of complex traits comb fingers picture of people male and female Boiko ethnic group for use of the data in the practice of forensics in identifying an unknown person. Research materials served dermatoglyphic parameters fingers male (112) and female (78) aged 19-55 years living in the Ivano-Frankivsk region and belonging to Boiko ethnic group. Prints of fingers comb pattern obtained by scanning their scanner Futronic's FS80 USB2.0 Fingerprint Scanner using the program *ftScanApiEx.exe.* with subsequent transfer of data to a personal computer. and improved by converting raster to vector graphic prints objects using the algorithm *VeriFinger 6.6/MegaMatcher 4.4* Identification Technology Algorithm. as a result of the study was first isolated dermatoglyphic phenotypes characteristic of male and female belonging Boiko ethno-territorial groups; found differences between papillary pattern middle and proximal phalanges of the fingers of male and female for gender differentiation criteria developed within specified ethno-territorial groups: females in the high frequency patterns and type Lr heterolateral symmetry type Lr + Lu on all fingers of both hands; for middle and proximal phalanges patterns predominate type Ad and S. In males the high frequency patterns type W, LW, lack of patterns such Lr on I, III, IV and V fingers of both hands; for middle and proximal phalanges patterns predominate type L, Ap, Ap / L, Dn ulnar orientation and drawings.

Keywords. Forensic medicine, dermatoglyphics, identification, gender differentiation.

Problem statement and analysis of recent research. Due to the current situation in Ukraine and the world (local military conflicts, environmental and technological disasters, etc.), problem of personal identification today is one of the topical issues of forensic medicine [1,2]. Dermatoglyphics, as a method of identification of persons in the practice of forensic examination plays an important role in the identification of mass casualties, in particular, to address the issue of kinship, common phenotypic characteristics (gender, ethno-racial background, etc.) [6-11].

It is known that the formation of dermatoglyphic pattern natives of a region affected geographic, climatic and other environmental factors [3,4,5]. In particular, V.P. Myshahyn [6], exploring dermatoglyphics fingers residents of Tobolsk region (Russia), found that in Tobolsk Tatars are a set of indicators comb skin of hands, which is the standard dermatoglyphic constitution of the indigenous population of Tobolsk region 's indigenous population Tobolsk dermatoglyphic region has a constitution similar to Tobolsk Tatars, and natives of Tobolsk region in the first generation are dermatoglyphics indicators that bring them closer to the original inhabitants - the Tatars and Russians. At the "Tobolsk continent" effect observed phenomenon of selective accumulation of persons dermatoglyphic constitution, approaching the indigenous population living in the area for many generations - Tobolsk Tatars. I.G. Shyrobokov [7], studying the anthropological composition and the origin Karel according dermatoglyphics, found that in the Karelian groups, on the one hand, the characteristic frequencies caucasian proportion of radial and radial patterns on ulnarnogo the hand and on the other hand, the overall incidence of radially oriented patterns they are extremely low (in the range of values found in the Negroid groups). Exploring the distal, middle and proximal phalanges of the fingers, L. Yu. Shpak [13] found that each of the phalangeal hand of different patterned specificity, expressed both types of patterns, and the orientation of papillary relief. Total patterned intensity decreases from distal to proximal phalanges. True delta patterns unique to the distal phalanx, the middle phalanx are difficult "deltoid" patterns, proximal phalanges are less patterned variety, but great constancy patterned finger for-

mulas. Large ornamental intensity characteristic both phalanges 3 and 4 fingers.

Thus, the lack of data on regional standards constitution population Boiko ethnic groups and the possibility of their use in forensic identification studies determine the relevance of the work.

The aim of our research is the study of complex traits comb fingers picture of male and female belonging to Boiko ethnic group for use of the data in the practice of forensics in identifying an unknown person.

Material and methods

Research materials served dermatoglyphic parameters fingers male (112) and female (78) aged 19-55 years living in the Ivano-Frankivsk region and belonging to Boiko ethnic group. The criteria for inclusion in the study was voluntary consent of the patient; lack of dermatological and genetic diseases, age 18 years or older. Exclusion criteria from the study served as a waiver on any stage, the presence of dermatological and genetic, persons under the age of 18 years. Dermatoglyphic examination procedure meets the requirements of the Helsinki Declaration (1975.). Prints of fingers comb pattern obtained by scanning their scanner Futronic's FS80 USB2.0 Fingerprint Scanner using the program *ftScanApiEx.exe.* with subsequent transfer of data to a personal computer. and improved by converting raster to vector graphic prints objects using the algorithm *VeriFinger 6.6 / MegaMatcher 4.4* Identification Technology Algorithm. In order to avoid errors in the macro algorithm is also used with a digital camera Nikon D3100 in the light of two LED-lamps with *svtlovym* flow in 1100 Lm, 450 placed at an angle to the horizontal surface on which the material was investigated. Processing of the data was performed by the standard method [4] when *makrorezhymi* studied qualitative and quantitative indicators *dermatohlifiv* fingers. Isolated main types of distal phalanges patterns: arch (A), radial (Lr) and ulnar (Lu) loops, curl (W) and complex patterns (LW) and medium and proximal phalanges: direct (S); with a slope (L); sickles distal (Hd) and proximal (Hp); arch distal (Ad) and proximal (Ar); distal arch / with tilt (L / Ad); proximal arch / with tilt (Ap / L); dual arch (Da); double curve / slope of (Da / L); wave (V); sickle of the event (Dh); sickle curve arc (Ah); featherlike (F); closed (CI); distal angle (Nd); proximal angle (Np); Double angle (Dn); distal curve / corner (Nd / Ad); proximal curve / corner (Ap / Np); random (AC). Mathematical processing of survey data conducted by uni- and multivariate statistical analysis [4].

Results and discussion

The study found that statistically significant ($p < 0.001$) sample of females Boiko ethno-territorial groups different from those for male performance compounding frequency curls and complex patterns - 3.5% and 33.0%, compounding frequency of radial loops on the fingers of both hands - 40.0% and 3.0%. Statistically significant ($p < 0.05$) for men and women differ in sampling values compounding frequency curves on the fingers of both hands - 0.5% and 3.0%. Frequency ulnar loops on the fingers of both hands among both groups is about the same - respectively 60.0% and 57.0%. Regarding the distribution patterns on different fingers of one person can be noted that in females group I-V and the fingers of both hands more often (70.0%) met the radial and less likely (20.0%) - ulnar loop. Males in 57.0% of cases occur ulnar loop in 33.0% of cases - complex patterns and loops. Frequency rest patterns was similar.

Regarding the distribution patterns on different fingers of one individual can note that men and on V fingers of both hands more often (57.0%) met Lu, W, LW - 33% of cases, and A and Lr met in 10.0% cases; moreover, patterns such Lr men not met the I, III, IV and V fingers of both hands, and - and fingers on both hands. Heterolateral symmetry in one of the following combinations met: as a repeat patterns type Lu was determined in 30.0% of all fingers and in 60.0% of cases - a combination Lu

+ W, LW on III-V fingers to type Lu IV-V fingers in 44.0% of cases. Most rarely encountered such patterns W, LW on III-V fingers of both hands (3.5%). In a female person on the fingers of both hands showed, mainly, two or three types of patterns in various combinations. However heterolateral symmetry defined patterns repeat type Lr + Lu on all the fingers of one individual in 31.0% of cases.

The total expense ridge both hands in males was 114,0±0,4, females - 94,0±0,4. Delta index in men was 7,7±0,5, women - 10,0±0,4.

Established statistical distribution pattern of papillary patterns on the middle and proximal phalanges of the fingers of male and female. Based on the data can be argued that males are more common dermatoglyphic following parameters: inclination of (L) (50,0%), while in females this parameter occurs with a frequency - 30,0%; proximal arc (Ar) (10,0%), proximal arch / with tilt (Ap / L) (15,0%); double angle (Dn) (10,0%), while for females detected above mentioned three pattern is not typical. However, females characterized detected these papillary patterns that are not characteristic of males, namely arch distal (Ad) (17,0%); direct (S) (35,0%). Regarding orientation papillary patterns in ulnar or radial direction can conclude that males 1.5 times dominated ulnar orientation papillary patterns and, in females, this pattern is not evident papillary patterns and orientation about the same .

Conclusions

Thus, as a result of the study was first isolated dermatoglyphic phenotypes characteristic of male and female belonging to Boiko ethno-territorial groups; found differences between papillary pattern middle and proximal phalanges of the fingers of women and gender and sexual differentiation criteria developed within specified ethno-territorial groups:

1. In females the high frequency patterns of Lr-type; heterolateral symmetry Lr + Lu-type on all fingers of both hands; for middle and proximal phalanges patterns predominate type Ad and S.

2. In males the high frequency patterns type W, LW; lack of patterns such Lr on I, III, IV and V fingers of both hands; for middle and proximal phalanges patterns predominate type L, Ap, Ap / L, Dn; ulnar orientation of patterns.

Prospects for further research in this direction. In the future study of finger dermatoglyphics of females and males of other ethnic groups living in the Ivano-Frankivsk region (Lemko and Hutsul) and development criteria of they differentiation.

References

1. Horbunov N.S., KlakN.N, Shekhovtsova Y.A. Prognostic dermatoglyphic possible signs of human (electronic edition). Herald of new medical technologies. 2012; №1: 4p.
2. Amit A. Mehta Digital Dermatoglyphis in ABO, Rh Blood Groups / Amit A. Mehta, Anjulika A. Mehta, Vaibhav Sonar. , J Indian Acad Forensic Med. October- December 2011; Vol. 33(4): 349-351.
3. 6. Seema, Mahajan A, Gandhi D, Singh M. Dermatoglyphics - Study and Review of literature , Novel Science International Journal of Medical Science (2012); 1 (6): 191-198.
4. Zvyahyn V.N., Mazur E.S., Voroshilov N.S., Ahmedyn R.L. Dyskrumynant canonical analysis ethno-territorial polymorphism in Example contrast etny groups, Journal of Tomsk state-owned University, 2008, 309: 115-117.
5. Tehako L.I., Zelenkov A.I. Social anthropology, Minsk, Belarus. Navuka, 2011, 224p.

6. Mishagin V.P., Zoroastrov O.M. Forensic aspects of regional dermatoglyphic characteristics. Medical science and education in the Urals. 2010; №1:112-114.

7. Shirobokov I.G. Dermatoglyphic data to the problem of formation of the modern population of the North-West of Russia . Ethnographic Review. 2012; №2: 87-99.

8. Andreeva A. Fenetyc population characteristics Yakutia (by Features dermatohlyfyc drawings). International magazine of exsperymental education, 2012; 4: 77-78.

9. Abue A.D., Ujaddughe M., Kpela M.T., Abuel A.D., The Arch Pattern Dermatoglyphics on the Toes of Hausa Ethnic Group of Nigeria, Advances in Anthropology, 2013. Vol.3(4): 237-239.

10. 14. Adetona M.O. Volar Digital Transverse Creases of the Nigerians, Journal of Biology, Agriculture and Healthcare, 2014, Vol.4(16): 127-131.

11. Temajl G., Milicic J., Skaric Juric T. et al. Analysis of Dermatoglyphic Traits in Albanian and Turkish Population Living in Kosovo , Coll. Antropol, 2009; № 33 (4): 1001-1005.

12. Deepa D., Chandra P., Ishwer T., A Study of Fingerprint in Relation to Gender and Blood Group among Medical Students in Uttarakhand Region, J. Indian Acad. Forensic Med., January-March 2014; Vol. 36(1): 23-27.

13. Shpak L.Y. On the classification of finger patterns. Bulletin of Anthropology. Science Almanac 2013;2 (24):132-140.

Козань Н.М., Коцюбинська Ю.З

Статевий диморфізм дерматогліфічних параметрів пальців рук населення бойківської етнічної групи

Кафедра патоморфології та судової медицини ДВНЗ «Івано-Франківський національний медичний університет», м.Івано-Франківськ, Україна nmkozan@gmail.com

Резюме. В статті викладено результати дослідження пальцевої дерматогліфіки рук осіб чоловічої та жіночої статі, які належать до бойківської етнічної групи, що проживає на території Івано-Франківської області. Метою нашого дослідження є вивчення комплексу ознак гребінцевого малюнку пальців рук осіб чоловічої і жіночої статі бойківської етнічної групи для подальшого використання отриманих даних у практиці судово-медичної експертизи при ідентифікації невідомої особи. Матеріалом дослідження слугували дерматогліфічні параметри пальців рук осіб чоловічої (112) та жіночої (78) статі віком 19-55 років, які проживають на території Івано-Франківської області і належать до бойківської етнічної групи. Відбитки гребінцевого малюнка пальців рук отримані шляхом сканування їх сканером Futronic's FS80 USB2.0 Fingerprint Scanner з використанням програми firScanApiEx.exe. з наступним перенесенням даних на персональний комп'ютер та покращені за допомогою перетворення растрових відбитків у векторні графічні об'єкти з використанням алгоритму VeriFinger 6.6/MegaMatcher 4.4 Identification Technology Algorithm. в результаті проведеного дослідження вперше виділено дерматогліфічні фенотипи, характерні для чоловіків і жінок бойківської етнотериторіальної групи; виявлено відмінності між папілярними візерунками середніх та проксимальних фаланг пальців рук осіб чоловічої та жіночої статі та розроблено критерії статевої диференціації в межах зазначеної етнотериторіальної групи: у осіб жіночої статі висока частота візерунків типу Lr та гетеролатеральної симетрії по типу Lr+Lu на усіх пальцях обох рук; на середніх та проксимальних фалангах переважають візерунки по типу Ad і S. У осіб чоловічої статі висока частота візерунків типу W,LW, відсутність візерунків типу Lr на I, III, IV та V пальцях обох рук; на середніх та проксимальних фалангах переважають візерунки по типу L, Ar, Ap/L, Dn та ульнарна орієнтація малюнків .

Ключові слова. Судова медицина, дерматогліфіка, ідентифікація особи, стаття.

Received 22.06.2015.