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АКТУАЛЬНІ ПИТАННЯ СУДОВО-МЕДИЧНОЇ ДЕРМАТОГЛІФІКИ

В.Д. Мішалов, І.В. Гунас, Г.Ф. Кривда, В.Т. Бачинський, В.В. Войченко

Резюме. У статті викладено дані про використання дерматогліфіки під час судово-медичної ідентифікації невідомої особи. Представлено нові перспективи використання сучасних досягнень у галузі криміналістичної криміналістики при вивченні дерматогліфічних моделей та розробці алгоритмів діагностики загальних фенотипічних рис людини. Проведено аналіз останніх наукових публікацій з даної проблеми.

Ключові слова: криміналістика, дерматогліфіка.

АКТУАЛЬНЫЕ ВОПРОСЫ СУДЕБНО-МЕДИЦИНСКОЙ ДЕРМАТОГЛИФИКИ

В.Д. Мишалов, И.В. Гунас, Г.Ф. Кривда, В.Т. Бачинский, В.В. Войченко

Резюме. В статье изложены данные об использовании дерматоглифики при судебно-медицинской идентификации неизвестного лица. Представлены новые перспективы использования современных достижений в области судебно-медицинской криминалистики при изучении дерматоглифических моделей и разработке алгоритмов диагностики общих фенотипических признаков человека. Проведен анализ последних научных публикаций по данной проблеме.

Ключевые слова: криминалистика, дерматоглифика.

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DISCRIMINATING MODELS OF DERMATOGLYPHIC PRIORITY OF PRACTICALLY HEALTHY MEN TO SOUTHERN OR OTHER ADMINISTRATIVE-TERRITORIAL REGIONS OF UKRAINE

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Summary. In the article, on the basis of peculiarities of indicators of finger and palmar dermatoglyphics, the analysis of reliable discriminatory models of the affiliation of practically healthy men to the southern or other administrative-territorial regions of Ukraine was constructed and conducted. In most cases, the combination of all dermatological variables has a low level of discrimination (the highest level is established between men of the southern and northern regions of Ukraine). Most often, discriminant variables between men of the southern and other regions of Ukraine are the type of pattern on the fingers of the right hand and the asymmetry of the comb account of the palm lines.

Key words: dermatoglyphic, administrative-territorial regions of Ukraine, discriminatory analysis, practically healthy men.

Introduction. The beginning of the twenty-first century was marked by a new outbreak of military conflicts around the world, waves of illegal migration from third countries, and an aggravation of the criminal and terrorist situation in regions where peace and quiet until recently were. Accordingly, the police need to answer the question of identification of living persons who deliberately conceal their place of origin and the identification of the deceased or their remains.

One of way to help answer this question is to use a dermatological study method. We should notice studies in which the features of the skin figure were studied among representatives of various ethnic minorities, tribes and certain regions, and the existence of relationships between the investigated parameters was proved [6, 9, 10].

Works of this nature are quite small in Ukraine [4]. And even they cannot completely satisfy the queries that are facing us in the current situation when it is necessary to apply a cheap and simple method that will help in solving the issue of recognizing the regional identity of the person. An optimal solution to the problem of regional identification of individuals would be to study healthy population from different regions of Ukraine for the presence of characteristic indicators of finger and palmar dermatology for each region.

The purpose of the study is to construct and analyze discriminant models of the affiliation of practically healthy men to the southern or other administrative-territorial regions of Ukraine on the basis of peculiarities of indicators of finger and

palmar dermatoglyphics.

Material and methods. From the database of research center of the National Pirogov Memorial Medical University, Vinnytsya primary dermatological figures were taken from 410 practically healthy men between the ages of 19 and 35 in the third generation of inhabitants of the respective administrative-territorial regions of Ukraine [1]: 47 from the south (Odesa, Mykolaiv, Kherson, Zaporizhian regions and Autonomous Republic of Crimea), 165 from the central (Vinnytsia, Cherkasy, Kirovograd, Poltava and Dnipropetrovsk regions), 71 - from the western (Volyn, Rivne, Lviv, Chernivtsi, Ternopil, Khmelnytskyi, Zakarpattia and Ivano-Frankivsk regions), 45 - from the eastern (Kharkiv, Lugansk and Donetsk regions); 72 from the northern (Zhytomyr, Kyiv, Chernihiv and Sumy regions). Conducted, with the help of a special questionnaire, analysis of medical and social factors, the living conditions of all those surveyed indicates a fairly high homogeneity of samples of somatically healthy men from different regions of Ukraine [5].

Imprints of the palmar surfaces of the brushes and the individual fingers of the right and left hands were obtained using a printing ink on a sheet of paper [2]. obtained dermatoglyphic material was analyzed by H. Cummins and Ch. Midlo [7] methods according to T. D. Gladkova [2].

The construction of discriminant models of the possible assignment of men to the eastern or other regions of Ukraine, based on the characteristics of dermatological indicators, is carried out in the licensed package «STATISTICA 6.1».

Results and its discussion. When taking into account indicators of finger and palmar dermatoglyphics, discriminatory function covers 81.6% of practically healthy men from the southern and central regions of Ukraine. Among practically healthy men in the *southern* and *central* regions of Ukraine, discriminant variables are the type of the 4 right hand finger pattern (TF_R4), the asymmetry of the index of the main palmar lines (RL_IK), comb count of 1 finger of the left hand (FRC_L1), the asymmetry of the comb account of 5 finger (RL_FRC5), type 5 left hand finger pattern (TF_L5) and asymmetry of comb account line a-b (RL_AB) (Table 1). Moreover, the greatest contribution to discrimination is the type of pattern has 4 finger of the right hand. All other discriminatory variables have a less significant but credible single effect on discriminating between aggregates. In general, the totality of all variables is insignificant (Wilkes Lambda statistics = 0.839; F = 6.336; p <0.001) discrimination between men from the southern and central regions of Ukraine (see Table 1).

With the help of established classification indices (Df) one can predict the relevance of indicators to «typical» for men of the south or «typical» for men in the central regions of Ukraine. Definition of Df is given in the form of equations, where the attribution to men of the southern region of Ukraine is possible at a value of Df close to 10.52, and to men of the central region of Ukraine - with the value of Df, close to 12.48:

- Df (for men of the southern region of Ukraine) = $TF_R4 \times 2,187 + RL_IK \times 0,412 + FRC_L1 \times 0,291 + RL_FRC5 \times 0,094 + TF_L5 \times 2,953 - RL_AB \times 0,074 - 10,52$;
- Df (for men of the central region of Ukraine) = $TF_R4 \times 2,737 + RL_IK \times 0,128 + FRC_L1 \times 0,352 + RL_FRC5 \times 0,220 + TF_L5 \times 3,414 + RL_AB \times 0,005 - 12,48$.

Table 1

Report of discriminatory analysis in practically healthy men of southern and central regions of Ukraine in dependence on features of indicators of finger and palmar dermatoglyphics

Wilks' Lambda: 0,839; F (6,199) = 6,336; p<0,0000					
Discriminant variables	Wilks' Lambda	Partial Lambda	F-remove (1,199)	p-level	Toler.
TF_R4	0,888	0,946	11,39	0,0009	0,985
RL_IK	0,874	0,960	8,205	0,0046	0,937
FRC_L1	0,865	0,970	6,073	0,0146	0,960
RL_FRC5	0,869	0,966	6,973	0,0089	0,925
TF_L5	0,860	0,976	4,904	0,0279	0,971
RL_AB	0,856	0,981	3,955	0,0481	0,993

Note: here and in similar tables Wilks' Lambda – Wilkes Lambda statistics; Partial Lambda – Wilkes Lambda statistics for a single variable contribution to discrimination between populations; F-remove – standard F-test for the corresponding Partial Lambda; p-level – p- level associated with the corresponding F-remove; Toler. – tolerance of a variable (measure of redundancy of a variable).

With consideration of parameters of finger and palmar dermatoglyphics discriminant function covers 67.8% of healthy men from *southern* and *western* regions of Ukraine. Between healthy men from southern and western regions of Ukraine discriminant variable is the asymmetry comb count line a-b (RL_AB), type the pattern of the 4 finger of the right hand (TF_R4), asymmetry comb count line b-c (RL_VS) and the pattern on the hypothenar of right hand (HIP_R) (Table 2). Moreover, the asymmetry of the comb account of the line a-b make largest contributor to discrimination. All other discriminatory variables have a less significant but credible single effect on discriminating between aggregates. In general, the set of all variables has small (statistics Wilks lambda = 0,860; F = 4,951; p <0.01) discrimination between men from the southern and western regions of Ukraine (see Table. 2).

The classification indices (Df) for men from the southern and western regions of Ukraine, depending on the

characteristics of finger and palm dermatoglyphics, have the form of the following equations:

$$Df \text{ (for men of the southern region of Ukraine)} = -RL_AB \times 0,065 + TF_R4 \times 2,278 + RL_BC \times 0,139 + HIP_R \times 6,665 - 8,063;$$

$$Df \text{ (for men of the western region of Ukraine)} = RL_AB \times 0,062 + TF_R4 \times 2,657 + RL_BC \times 0,258 + HIP_R \times 7,691 - 10,04.$$

Table 2

Report of discriminatory analysis in practically healthy men of southern and western regions of Ukraine in dependence on features of indicators of finger and palmar dermatoglyphics

Wilks' Lambda: 0,860; F (4,113) = 4,591; p<0,0018					
Discriminant variables	Wilks' Lambda	Partial Lambda	F-remove (1,113)	p-level	Toler.
RL_AB	0,910	0,945	6,520	0,0120	0,940
TF_R4	0,895	0,961	4,552	0,0350	0,983
RL_BC	0,899	0,956	5,148	0,0252	0,930
HIP_R	0,898	0,958	4,920	0,0285	0,972

With consideration the index of finger and palmar dermatoglyphics, the discriminatory function covers 70.7% of practically healthy men from the *southern* and *eastern* regions of Ukraine. Among practically healthy men from the southern and eastern regions of Ukraine, discriminant variables are the comb count of the third finger of the left hand (FRC_L3), the type of the 1 right hand finger pattern (TF_R1), the value of the right hand angle dat (DAT_R) and the asymmetry of the pattern on the tenar (RL_TEN) (Table 3). Moreover, the greatest contribution to discrimination is the comb account of the 3 finger of the left hand. All other discriminatory variables have less significant, but in the majority of cases, a solid single effect on discrimination between aggregates (with the exception of the asymmetry of the pattern on the tenar). In general, the totality of all variables is negligible (Wilkes Lambda statistics = 0,809; F = 5,127; p <0,001) discrimination between men from the southern and eastern regions of Ukraine (see Table 3).

Table 3

Report of discriminatory analysis in practically healthy men of southern and eastern regions of Ukraine in dependence on features of indicators of finger and palmar dermatoglyphics

Wilks' Lambda: 0,809; F (4,870) = 5,127; p<0,0009					
Discriminant variables	Wilks' Lambda	Partial Lambda	F-remove (1,870)	p-level	Toler.
FRC_L3	0,852	0,945	4,562	0,0355	0,955
TF_R1	0,847	0,961	4,089	0,0462	0,999
DAT_R	0,848	0,956	4,217	0,0430	0,944
RL_TEN	0,844	0,958	3,716	0,0571	0,982

The classification indices (Df) for men from the southern and eastern regions of Ukraine, depending on the characteristics of finger and palm dermatoglyphics, have the form of the following equations:

$$Df \text{ (for men of the southern region of Ukraine)} = FRC_L3 \times 0,013 + TF_R1 \times 2,805 + DAT_R \times 1,290 + RL_TEN \times 21,75 - 52,26;$$

$$Df \text{ (for men of the eastern region of Ukraine)} = FRC_L3 \times 0,093 + TF_R1 \times 2,365 + DAT_R \times 1,362 + RL_TEN \times 23,58 - 58,10.$$

In previous studies [8] it was proved that, taking into account the indicators of finger and palmar dermatoglyphics, the discriminatory function covers 80.9% of practically healthy men from the *southern* and *northern* regions of Ukraine. Between practically healthy men of these groups, discriminant variables are the asymmetry of the comb account line a-b (RL_AB), the type of the pattern 4 thumb of the right hand finger (TF_R4), the comb count of 3 finger of the right hand (FRC_R3), the asymmetry of the comb account of the line c-d (RL_CD), the asymmetry of the magnitude of the angle atb (RL_ATB), the left hand btc angle (BTC_L) and the frequency of the intermediate axial three-radius of the left palm (T1_R), while the largest contribution to discrimination make the asymmetry of the comb account of the a-b line. All other discriminatory variables have a less significant but credible single effect on discriminating between aggregates. In general, the totality of all variables is almost average (Wilks Lambda statistics = 0.665; F = 7.310; p <0.001) of discrimination between men from the southern and northern regions of Ukraine.

In determining the significance of all discriminatory functions using the criterion χ^2 it is established that a reliable interpretation of the classification indices can be found between practically healthy men of the eastern and other regions of Ukraine.

Comparing the results we obtained with the results of discriminant analysis in the research of N.M. Kozan [3], it should be noted that we have significantly higher values of Wilks' Lambda statistics and, accordingly, lower levels of discrimination due to the entry into different regions of Ukraine different ethnic groups.

Conclusion

1. The highest level of discrimination was established with the northern region based on the specificity of the dermatological indicators of reliable discriminant models of the affiliation of virtually healthy men to the southern or other administrative-territorial regions of Ukraine.

2. The most commonly discriminatory variables between men in the southern and other regions of Ukraine are the type of pattern on the fingers of the right hand and the asymmetry of the comb account of the palm lines.

Important for the further perspective is the factorial analysis of peculiarities of finger and palm dermatoglyphic indices for the inclusion of virtually healthy men in different administrative-territorial regions of Ukraine.

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ДИСКРИМІНАНТНІ МОДЕЛІ ДЕРМАТОГЛІФІЧНОЇ ПРИНАЛЕЖНОСТІ ПРАКТИЧНО ЗДОРОВИХ ЧОЛОВІКІВ ДО ПІВДЕННОГО АБО ІНШИХ АДМІНІСТРАТИВНО-ТЕРИТОРІАЛЬНИХ РЕГІОНІВ УКРАЇНИ

Мишалов В. Д., Гунас В. І.

Резюме. В статті, на основі особливостей показників пальцевої і долонної дерматогліфіки, побудовані і проведено аналіз достовірних дискримінантних моделей приналежності практично здорових чоловіків до південного або інших адміністративно-територіальних регіонів України. В більшості випадків сукупність усіх дерматогліфічних змінних мають незначний рівень дискримінації (найвищий рівень встановлено між чоловіками південного і північного регіонів України). Найчастіше дискримінантними змінними між чоловіками південного та інших регіонів України є тип візерунку на пальцях правої кисті і асиметрія гребінцевого рахунку долонних ліній.

Ключові слова: дерматогліфіка, адміністративно-територіальні регіони України, дискримінантний аналіз, практично здорові чоловіки.

ДИСКРИМІНАНТНЫЕ МОДЕЛИ ДЕРМАТОГЛИФИЧЕСКОЙ ПРИНАДЛЕЖНОСТИ ПРАКТИЧЕСКИ ЗДОРОВЫХ МУЖЧИН К ЮЖНОМУ ИЛИ ДРУГИМ АДМИНИСТРАТИВНО-ТЕРРИТОРИАЛЬНЫМ РЕГИОНАМ УКРАИНЫ

Мишалов В. Д., Гунас В. И.

Резюме. В статье, на основе особенностей показателей пальцевой и ладонной дерматоглифики, построены и проведен анализ достоверных дискриминантных моделей принадлежности практически здоровых мужчин к южному или другим административно-территориальным регионам Украины. В большинстве случаев совокупность всех дерматоглифических переменных имеют незначительный уровень дискриминации (самый высокий уровень установлен между мужчинами южного и северного регионов Украины). Чаще всего дискриминантными переменными между мужчинами южного и других регионов Украины является тип узора на пальцах правой кисти и асимметрия гребешкового счета ладонных линий.

Ключевые слова: дерматоглифика, административно-территориальные регионы Украины, дискриминантный анализ, практически здоровые мужчины.

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СТАТИСТИЧНИЙ І ПРОБЛЕМНИЙ АНАЛІЗ ПИТАННЯ ІДЕНТИФІКАЦІЇ ТА СУДОВО-МЕДИЧНОЇ ЕКСПЕРТИЗИ ТРУПІВ У ВИПАДКАХ МАСОВОЇ ЗАГИБЕЛІ ЛЮДЕЙ ВНАСЛІДОК БОЙОВИХ ДІЙ НА ПРИКЛАДІ АНТИТЕРОРИСТИЧНОЇ ОПЕРАЦІЇ НА СХОДІ УКРАЇНИ

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Резюме. Проведено аналіз судово-медичних експертиз, виконаних у відношенні трупів, доставлених із зони антитерористичної операції на сході України за навантаженням на певні бюро судово-медичної експертизи, за причинами смерті, віковим розподіленням груп померлих тощо. Висвітлені основні проблемні питання, що виникають при проведенні таких експертиз, особливо щодо ідентифікації осіб померлих та викладені основні можливі напрямки роботи, спрямованої на оптимізацію процесу ідентифікації осіб у випадках масової загибелі людей.

Ключові слова: судово-медична експертиза, ідентифікація.