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SIMULATION USING DISCRIMINANT ANALYSIS THE COURSE OF PYODERMA IN MEN AND WOMEN OF WESTERN REGION OF UKRAINE DEPENDING ON THE CHARACTERISTICS OF CONSTITUTIONAL PARAMETERS OF BODY

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Summary

The article describes and analyzed built, using discriminant analysis models of possible course of pyoderma in men and women of western regions Ukraine, depending on the characteristics of the structure and size of the body. Prove the possibility to predict the course of pyoderma based on the constitutional parameters of the body in both men (73.3% correct models of cases with different forms of dermatosis, statistics Wilks' Lambda = 0.416, p <0.001) and in women (68.8% correct models of cases with different forms of dermatosis; statistics Wilks' Lambda = 0,386; p<0,001), which is confirmed by practical test of their work on another sample of male patients (from 66.7% to 75.0% of cases with different forms of dermatosis) and women (from 50.0% to 80.0% of cases with different forms of dermatosis) of similar age and residence.

Key words: discriminant model, peculiarities of pyoderma, men and women in Western Ukraine.

МОДЕЛЮВАННЯ ЗА ДОПОМОГОЮ ДИСКРИМІНАНТНОГО АНАЛІЗУ ПЕРЕБІГУ ПІОДЕРМІЙ У ЧОЛОВІКІВ І ЖІНОК ЗАХІДНОГО РЕГІОНУ УКРАЇНИ В ЗАЛЕЖНОСТІ ВІД ОСОБЛИВОСТЕЙ КОНСТИТУЦІОНАЛЬНИХ ПАРАМЕТРІВ ТІЛА

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Резюме

В статті описано та проведено аналіз побудованих, за допомогою дискримінантного аналізу, моделей можливого перебігу піодермій у чоловіків і жінок західних регіонів України в залежності від особливостей будови та розмірів тіла. Доведено можливість прогнозувати перебіг піодермій на основі конституціональних параметрів тіла як у чоловіків (коректність моделей 73,3 % випадків при різних формах дерматозу; статистика Уілкса лямбда = 0,416; р<0,001), так і у жінок (коректність моделей 68,8 % випадків при різних формах дерматозу; статистика Уілкса лямбда = 0,386; р<0,001), що підтверджується практичною перевіркою їх роботи на іншій вибірці хворих чоловіків (від 66,7 % до 75,0 % випадків при різних формах дерматозу) і жінок (від 50,0 % до 80,0 % випадків при різних формах дерматозу) аналогічного віку та місця проживання.

Ключові слова: дискримінантні моделі, особливості перебігу піодермій, чоловіки та жінки західного регіону України.

Резюме

МОДЕЛИРОВАНИЕ С ПОМОЩЬЮ ДИСКРИМИНАНТНОГО АНАЛИЗА ТЕЧЕНИЯ ПИОДЕРМИЙ У МУЖЧИН И ЖЕНЩИН ЗАПАДНОГО РЕГИОНА УКРАИНЫ В ЗАВИСИМОСТИ ОТ ОСОБЕННОСТЕЙ КОНСТИТУЦИОНАЛЬНЫХ ПАРАМЕТРОВ ТЕЛА. В статье описано и проведено анализ построенных с помощью дискриминантного анализа моделей возможного течения пиодермий у мужчин и женщин западных регионов Украины в зависимости от особенностей строения и размеров тела. Доказано возможность прогнозировать течение пиодермий на основе конституциональных параметров тела как у мужчин (корректность моделей 73,3 % случаев при разных формах дерматоза; статистика Уилкса лямбда = 0,416;

р<0,001), так и у женщин (корректность моделей 68,8 % случаев при разных формах дерматоза; статистика Уилкса лямбда = 0,386; р<0,001), что подтверждается практической проверкой их работы на другой выборке больных мужчин (от 66,7 % до 75,0 % случаев при разных формах дерматоза) и женщин (от 50,0 % до 80,0 % случаев при разных формах дерматоза) аналогичного возраста и места проживания.

Ключовые слова: дискриминантные модели, особенности течения пиодермий, мужчины и женщины западных регионов Украины.

Relevance of the topic. Because each type of constitution peculiar characteristics, including both morphometric parameters and activity of the nervous and endocrine systems, metabolism, structure and function of internal organs, so far taxonomic relationship of constitution and specific disease is manifested by a number of constitutional dependent features which are often regarded as factors the risk of disease [1, 2].

As you know, purely dermatological diseases exist. According to pronounced skin reaction hidden disruption of liver, kidneys, and lymphatic and immune systems. Therefore, screening for skin diseases should consist of carefully calibrated range of tests and examinations in other medical specializations that are designed not just to detect diseases of the skin (often this can be done with the naked eye), and identify the true causes of all available body disorders. Perspective is a combination of the above mentioned diagnostic complex with anthropo-somatotypological research, in fact, the study of basic morphological indices and body components variability [3, 4].

To reduce the increase in incidence of various forms and types of pyoderma course requires the active prognostic and preventive work, which is possible only with careful study of structural characteristics of healthy and sick during screening, followed by detection of group at risk for the appearance of dermatosis.

The aim - to develop a discriminant model features of pyoderma in men and women of the first mature age residents of western regions of Ukraine, depending on the characteristics of anthropometric and body somatotypological parameters.

Material and methods. In the Lviv National Medical University named after Danylo Halytsky conducted clinical and anthropological examination of 45 patients with pyoderma men aged 22 to 35 years, and 48 patients with pyoderma women aged 21 to 35 years, and 24 healthy men and 43 healthy

women of similar age in the third generation residents of western regions of Ukraine. From a database of Vinnitsa National Medical University named after Pirogov taken primary anthropometric indices of 61 healthy men and 92 healthy women of similar age in the third generation residents of Rivne, Ternopil and Khmelnytsky regions of Ukraine.

Anthropometry held by the scheme V. Bunak [5]. Somatotype components were determined by the method of J. Carter and B. Heath [6] and the component indices of body weight - by the method of J. Matiegka [7] and the American Institute of Nutrition [8].

For modeling of possible course of pyoderma in men or women based on anthropometric and somatotypological indices used method of step discriminant analysis in license package «STATISTICA 6.1».

Results and discussion. Established that the model for patients with superficial and deep pyoderma occurring acute and chronic patients with pyoderma men correct in 73.3% of cases and has an average (statistics Wilks' Lambda = 0,416; F = 12,8; p <0.001) discrimination between men suffering from different forms of dermatosis. The largest contribution to discriminate between patients with different forms of pyoderma for men has height of pubic anthropometric points. Identified coefficients classification discriminant functions that enable to calculate the index classification (Df), through which may include indicators that were studied, the "standard" for healthy men or to the "typical" for patients with pyoderma men. Below, in the form of equations shown definition of the indicator where Df referring to male patients with superficial pyoderma occurring acute sense possible at Df, close to 271,4; men suffering from deep pyoderma occurring sharply - at a value of Df, close to 255.2; and to men patients with chronic pyoderma - a value Df, close to 239.4:

Df (*for men suffering from superficial pyoderma occurring acute*) = – thickness of skin and fat folds (TSFF) under the lower angle of the scapula × 0,452 + the width of distal epiphysis shoulder × 16,70 + arm circumference in the lower part × 1,347 - foot girth height × 1,589 + anthropometric pubic point × 4,788 + waist circumference × 1,095 - body surface area × 190,5 + circumference at chest in the pause × 2,911 - 271,4;

Df (*for men suffering from deep pyoderma occurring acute*) = - TSFF under the lower angle of the scapula × 0,453 + the width of distal epiphysis shoulder × 15,47 + arm circumference in the lower part × 2,566 - foot girth height × 2,106 + anthropometric pubic point × 4.530 + waist circumference × 0,779 - body surface area × 178,1 + chest girth in the pause × 3,008 – 255,2,

Df (*for male patients with chronic pyoderma*) = - TSFF under the lower angle of the scapula × 0,670 + the width of distal epiphysis shoulder × 14,24 + arm circumference in the lower part × 1,861 - foot girth height × 1,125 + anthropometric pubic point × 4,367 + waist circumference × 0,970 - body surface area × 173,6 + chest girth in the pause × 2,732 – 239,4,

where (here and further) TSFF - in mm; encompassing dimensions - to cm; the width of distal epiphysis of long bones of limbs - in cm; height of anthropometric points - in cm; body surface area - in m^2.

When determining the significance of each discriminant functions using criteria χ^2 found that the possible significant interpretation of the performance classification among all forms of male patients with pyoderma.

Model in patients with superficial and deep pyoderma occurring acute and chronic patients with pyoderma women posed in 68.8% of cases and has, like in men, average (statistics Wilks' Lambda = 0,386; F = 13,4; p <0.001) discrimination between women suffering from different forms of dermatosis. The largest contribution to discriminate between patients with different forms of pyoderma women has grasp forearm in the upper part. Performance of classification (Df) for patients with various forms of pyoderma women depending on the characteristics parameters of constitutional bodies have the appearance of the following equations:

Df (*for women suffering from superficial pyoderma occurring acute*) = the width of the distal femur epiphysis × 71,70 + the width of the distal tibia epiphysis × 12,78 - forearm circumference in the upper part × 5,183 + shoulder width × 4,615 + body length × 5,382 + TSFF under the lower angle of the scapula × 4,205 - the value of lipid component of body weight per Matejko × 9,737 – 779,6;

Df (*for women suffering from deep pyoderma occurring acute*) = the width of the distal femur epiphysis × 74,35 + the width of the distal tibia epiphysis × 15,82 - forearm circumference in the upper part × 6,310 + shoulder width × 5,000 + body length × 5,383 + TSFF under the lower angle of the scapula × 3,729 - the value of lipid component of body weight per Matejko × 9,222 – 808,8,

Df (*for women patients with chronic pyoderma*) = the width of the distal femur epiphysis × 71,18 + the width of the distal tibia epiphysis × 15,69 - forearm circumference in the upper part × 6,000 + shoulder width × 5,007 + body length × 5,199 + TSFF under the lower angle blade × 3,713 - the value of lipid component of body weight per Matejko × 9,215 – 758,8,

where the diameter of the trunk - in cm; body length - in cm; component composition of body weight - in kg.

When determining the significance of each discriminant functions using criteria χ^2 found that the possible significant interpretation of the of classification performance among all forms of female patients with pyoderma

When analyzing built models features of pyoderma possibilities found that in man their composition includes encompassing body size (50.0%) and total, longitudinal body size, the width and TSFF of distal epiphysis of long bones of the extremities (12.5%); and women - the width distal epiphysis of long bones of the extremities (28.6%) and in total, encompassing, cross body size, performance and TSFF component of body weight (by 14.3%). The largest contribution to the

discrimination in men making longitudinal body size (100%), and women - encompassing body size (100 %).

For check of work constructed discriminant models features of pyoderma we have further examined 10 healthy and patients with pyoderma men and women from western regions of Ukraine. Established the following distribution of various forms of pyoderma: among 10 male patients - 4 with acute superficial, 3 with acute deep and chronic 3; and among the 10 female patients - 5 with acute surface, 3 with acute deep and 2 with chronic. Using pre-built models, we found that from 4 patients with superficial pyoderma men at risk of this form of the disease fell 3 representatives (75.0%); from 3 patients with deep pyoderma men - 2 representatives (66.7%) and 3 patients with chronic pyoderma men - 2 representatives (66.7%). Accordingly, from 5 patients with superficial pyoderma women at risk of this form of the disease fell 4 representatives (80.0%); from 3 patients with deep pyoderma women - 2 representatives (66.7%) and 2 patients with chronic pyoderma women - 1 representative (50,0 %).

Thus the results obtained, given the practical check of work discriminant model possibilities features of pyoderma depending on the characteristics of constitutional parameters of the body, as opposed to the possibility of this disease [9], point to their relatively high correctness in both men and women of Western regions Ukraine.

Conclusions. 1. Developed on the base of constitutional body discriminant model parameters to predict the course of pyoderma possibility in men (73.3% of correctness in different forms of dermatosis, statistics Wilks' Lambda = 0.416, p <0.001) and women (68.8% of correctness in different forms of dermatosis, statistics Wilks' Lambda = 0.386, p <0.001) the western regions of Ukraine confirmed their inspection work in another sample of patients with various forms of pyoderma men (from 66.7% to 75 0% of cases with different forms of dermatosis) and women (from 50.0% to 80.0% of cases with different forms of dermatosis) of similar age and place of residence.

2. The structure of models in men includes often encompassing body size (50.0%), while women - width distal epiphysis of long bones of the extremities (28.6%). The largest contribution to the discrimination in men making longitudinal body size (100%), and women - encompassing body size (100%).

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