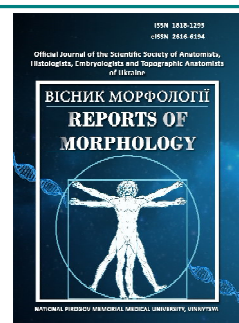




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Total, longitudinal and transverse body sizes in men with psoriasis of different somatotypes

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CONFLICT OF INTEREST

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Using a constitutional approach to predict the onset of a disease can be key not only to solving the problem of late-stage lifestyle modification therapy but also to understanding the deep, seemingly incomprehensible links between organs and body structure. The aim of the study was to establish and analyze the differences in total, longitudinal and transverse body sizes between healthy and/or psoriatic men of different somatotypes depending on the severity of the disease. Anthro-somatotypological examination was performed on Ukrainian men (aged 22 to 35 years) with psoriasis (n=100, including 32 with mild and 68 with severe). A clinical assessment of the severity and area of psoriatic lesions was performed using the PASI index. Anthropometric data of 82 practically healthy men of the same age group was taken from the data bank of the research center of National Pirogov Memorial Medical University, Vinnytsya. Statistical processing of the obtained results was performed in the license package "Statistica 5.5" using non-parametric evaluation methods. In patients with mild and severe psoriasis, men of mesomorphic and endo-mesomorphic somatotypes in comparison with healthy men of the corresponding somatotypes, higher values of almost all total (in the endo-mesomorphs with severe disease), transverse (except for shoulder width) and lateral body size (except endo-mesomorphs with severe disease) was found. In patients with psoriasis, men of endo-mesomorphic somatotype with a mild course of the disease found greater than in patients with a similar course men of mesomorphic somatotype, body weight, length and surface area, height of acromial and finger anthropometric points, and transverse middle thoracic diameters and anteroposterior middle thoracic diameter; and in patients with psoriasis men of endo-mesomorphic somatotype with a severe course of the disease - only greater values than in patients with a similar course of the disease men of mesomorphic somatotype, interspinous distance. When comparing the total, longitudinal and transverse dimensions of the body between men with psoriasis of the corresponding somatotypes, in representatives of the mesomorphic somatotype with a mild course of the disease found greater than with severe course, body length values and lower - posterior middle thoracic diameter. The revealed differences in total, longitudinal and transverse body sizes between healthy and/or patients with mild or severe psoriasis Ukrainian men of mesomorphic and endo-mesomorphic somatotypes provide an opportunity to increase the effectiveness of the use of body structure and size to identify risk groups psoriasis.

Keywords: psoriasis, total, longitudinal and transverse body sizes, somatotype, men.

Introduction

Psoriasis may seem like a simple skin condition at first glance. However, in reality, this nosology hides one of the most common pathologies that can be found in all parts of the world, with a complex, unexplored process of pathogenesis, which affects mostly able-bodied people and has huge consequences for the psychological sphere of human life [2, 14, 17, 23].

When focusing on the pathogenesis of this disease, scientists ultimately agree that a key element in the development of psoriasis is the inflammatory component. Systemic inflammation that occurs in psoriasis causes an increase in a number of inflammatory cytokines, including IL-6, IL-17, IL-20, IL-22 and IL-23. In addition, there is ample evidence of the association of psoriasis with other systemic

inflammatory diseases of the human body [14].

An analysis of population data conducted in the United States from 2011 to 2014 revealed that the prevalence of psoriasis in the adult population is 3.0 % (95 % CI, 2.6 % - 3.4 %). Moreover, the prevalence was the same for both men and women (2.8 % (95 % CI, 2.4 % - 3.3 %) and 3.2 % (95 % CI, 2.6 % - 3.8 %) in accordance). The highest prevalence was observed among the white population 3.6 % (95 % CI, 2.9 % - 4.2 %), and the lowest among blacks 1.5 % (95 % CI, 1.0 % - 2.0 %) [2]. Data from previous years, namely 1999-2013, indicate a lower prevalence of psoriasis in the United States during this period. Thus, in 1999 the prevalence rate was only 2.3 % [25].

A similar study conducted in China found the following data: the prevalence of psoriasis was 0.47 %; prevalence in men 0.54 %; prevalence in women 0.44 % [11].

A long-term study of the prevalence of psoriasis was conducted in Denmark and covered the years 2003-2012. In this Scandinavian country, the prevalence of the disease is 2.2 %. Researchers have noted an increase in the incidence rate over time, which peaked in 2010. In addition, higher levels of the disease were found in women and in the age group of 60-69 years [13]. In Brazil, there are also gender differences and the prevalence of psoriasis. In women, this figure is 1.15 % (CI 95 % 0.90-1.43 %) and 1.47 % (CI 95 % 1.11-1.82 %) in men ($p=0.22$), and in the country as a whole the prevalence rate is 1.31 %. As in Denmark, the highest incidence is observed in the age group after 60 years - 2.29 % (CI 95 % 1.71-2.84 %) [22].

However, the question remains - can we confidently say about the increase in the incidence of psoriasis? A longer-term assessment is needed to answer this question. Norwegian scientists have estimated the prevalence of psoriasis in the local population for 30 years (from 1979 to 2008). If in 1979 the prevalence of psoriasis was 4.8 %, in 2008 this figure was already 11.4 % [9].

The versatility of psoriasis is manifested in a large number of complications and concomitant diseases that accompany it. According to Lakshmy S. and co-authors [17], the prevalence of depression in patients with this disease is 78.9 %, and anxiety - 76.7 %. In addition, patients have problems with frequent feelings of shame, anger, anxiety and irritation (most of them are more common in women than men), problems at work and other social difficulties in life [23].

Predicting the occurrence and severity of the disease in this regard is an important topic for research that requires a simple and elegant solution. The way to solve this problem can be the application of a constitutional approach - the study of certain anthropometric indicators. This method is successfully used in various fields and has shown a wide range of applications and the ability to identify the relationship between the various components of the human body [19].

The aim of the study was to establish and analyze the differences in total, longitudinal and transverse body sizes between healthy and/or psoriatic men of different somatotypes depending on the severity of the disease.

Materials and methods

An anthropometric examination, according to the scheme of V.V. Bunak [6], men (aged 22 to 35 years) with psoriasis ($n=100$, including 32 with mild and 68 with severe), who were examined on base of the Military Medical Clinical Center of the Central Region and the Department of Dermatology and Venereal Diseases with a course of postgraduate education National Pirogov Memorial Medical University, Vinnytsya have been done. Assessment of somatotype was performed according to the method of Heath Carter [7].

Committee on Bioethics of National Pirogov Memorial Medical University, Vinnytsya (protocol № 2 From 20.02.2020) found that the studies do not contradict the basic bioethical standards of the Declaration of Helsinki, the Council of Europe Convention on Human Rights and Biomedicine (1977), the relevant WHO regulations and laws of Ukraine.

Clinical assessment of the severity and area of psoriatic lesions was performed using the PASI index (Psoriasis Area and Severity Index) [3, 16].

As a control from the database of the research center of the National Pirogov Memorial Medical University, Vinnytsya selected anthropometric data of 82 practically healthy men of the same age group.

Statistical processing of the obtained results was performed in the license package "Statistica 5.5" using non-parametric evaluation methods. The reliability of the difference between the values between the independent quantitative values was determined using the U-Mann-Whitney test.

Results

Significant or trends in differences in total, longitudinal and transverse body sizes between healthy and/or psoriatic men of mesomorphic and endo-mesomorphic somatotypes are shown in tables 1 and 2.

Discussion

Thus, *when comparing men with psoriasis of different somatotypes with healthy men of the corresponding somatotypes*, it was found:

- in patients with psoriasis men of *mesomorphic somatotype* - higher values of body weight by 17.0 % and 18.3 % (in the future, respectively, for mild and severe); body length by 1.9 % (only for mild course); body surface area by 8.3 % and 7.6 %; heights of the supra thoracic anthropometric point by 3.6 % and 2.0 %; heights of acromial anthropometric point by 3.0 % and 1.4 %; heights of the finger anthropometric point by 6.3 % and 4.6 %; transverse middle thoracic diameter by 16.2 % and 19.1 %; transverse lower thoracic diameter by 15.9 % and 17.6 %; anteroposterior middle thoracic diameter by 16.4 % and 24.7 %; interspinous distance by 13.6 % and 14.3 %; intercrystal distance by 14.8 % and 13.3 %; intertrochanteric distance by 10.8 % and 10.4 %; and lower values of pubic

Table 1. Comparison of total and longitudinal body sizes between healthy and psoriatic men of mesomorphic and endo-mesomorphic somatotypes ($M \pm \sigma$).

Indicators	Healthy		p	Psoriasis MC		p	Psoriasis SC		p
	mes.	en-mes.		mes.	en-mes.		mes.	en-mes.	
W	76.43±9.78	79.92±7.47	>0.05	89.48±14.68#	111.5±16.3&	<0.01	90.38±13.20#	90.51±25.28	>0.05
H	175.8±6.9	177.8±5.9	>0.05	179.2±4.9*	185.5±3.1*	<0.05	176.4±4.6	179.2±8.9	>0.05
S	1.923±0.149	1.977±0.116	>0.05	2.082±0.157#	2.346±0.164&	<0.01	2.069±0.144#	2.087±0.313	>0.05
ATND	142.5±6.5	144.5±5.7	>0.05	147.6±4.4#	152.5±6.4t	>0.05	145.4±4.0*	147.3±8.2	>0.05
ATL	89.21±5.46&	90.82±4.54	>0.05	87.46±3.86	90.05±1.42	>0.05	85.66±4.36	87.13±4.06	>0.05
ATPL	145.2±7.3	147.6±6.6	>0.05	149.5±4.7*	156.0±3.5*	<0.05	147.2±4.0t	151.0±6.1	>0.05
ATP	65.61±5.49	66.31±4.74	>0.05	69.77±2.94#	72.50±3.00*	<0.05	68.63±3.00#	69.67±3.94	>0.05
ATV	92.38±5.96&#	95.92±3.75*&	<0.05	86.21±11.29	91.75±2.63	>0.05	87.59±4.96	89.44±3.71	>0.05

Notes: in this and the following table, MC - mild course; SC - severe course; mes. - representatives of the mesomorphic somatotype; en-mes. - representatives of the endo-mesomorphic somatotype; p - significance of differences in indicators in groups of healthy or sick men between mesomorphs and endo-mesomorphs; *, &, # - significant differences (respectively <0.05, <0.01 or <0.001) between the corresponding indicators in the groups of healthy and patients with mild psoriasis mesomorphs or endo-mesomorphs (higher values are noted); *, &, # - significant differences (respectively <0.05, <0.01 or <0.001) between the corresponding indicators in the groups of healthy and patients with severe psoriasis mesomorphs or endo-mesomorphs (higher values are noted); t - the tendency of differences between the corresponding indicators in the groups of healthy and patients with mild psoriasis of mesomorphs or endo-mesomorphs (higher indicators are noted); t - the tendency of differences between the corresponding indicators in groups of healthy and patients with psoriasis of severe mesomorphs or endo-mesomorphs (higher indicators are noted); significantly higher values of indicators were noted in yellow (<0.05) when comparing between the corresponding somatotypes of patients with mild and severe psoriasis; significantly (<0.01) higher values of indicators were noted in green when comparing patients with mild and severe psoriasis according to the corresponding somatotypes; W - body weight (kg); H - body length (cm); S - body surface area (m²); ATND - height of the thoracic anthropometric point (cm); ATL - height of the pubic anthropometric point (cm); ATPL - height of acromial anthropometric point (cm); ATP - height of the finger anthropometric point (cm); ATV - height of trochanteric anthropometric point (cm).

Table 2. Comparison of transverse body sizes between healthy and psoriatic men of mesomorphic and endo-mesomorphic somatotypes ($M \pm \sigma$).

Indicators	Healthy		p	Psoriasis MC		p	Psoriasis SC		p
	mes.	en-mes.		mes.	en-mes.		mes.	en-mes.	
W	76.43±9.78	79.92±7.47	>0.05	89.48±14.68#	111.5±16.3&	<0.01	90.38±13.20#	90.51±25.28	>0.05
H	175.8±6.9	177.8±5.9	>0.05	179.2±4.9*	185.5±3.1*	<0.05	176.4±4.6	179.2±8.9	>0.05
S	1.923±0.149	1.977±0.116	>0.05	2.082±0.157#	2.346±0.164&	<0.01	2.069±0.144#	2.087±0.313	>0.05
ATND	142.5±6.5	144.5±5.7	>0.05	147.6±4.4#	152.5±6.4t	>0.05	145.4±4.0*	147.3±8.2	>0.05
ATL	89.21±5.46&	90.82±4.54	>0.05	87.46±3.86	90.05±1.42	>0.05	85.66±4.36	87.13±4.06	>0.05
ATPL	145.2±7.3	147.6±6.6	>0.05	149.5±4.7*	156.0±3.5*	<0.05	147.2±4.0t	151.0±6.1	>0.05
ATP	65.61±5.49	66.31±4.74	>0.05	69.77±2.94#	72.50±3.00*	<0.05	68.63±3.00#	69.67±3.94	>0.05
ATV	92.38±5.96&#	95.92±3.75*&	<0.05	86.21±11.29	91.75±2.63	>0.05	87.59±4.96	89.44±3.71	>0.05

Notes: PSG - transverse middle thoracic diameter (cm); PNG - transverse lower thoracic diameter (cm); SGK - anterior-posterior middle thoracic diameter (cm); ACR - shoulder width (cm); SPIN - interspinous distance (cm); CRIS - intercrystal distance (cm); TROCH - intertrochanteric distance (cm).

anthropometric point height by 4.2 % (only for severe); the height of the trochanteric anthropometric point by 7.2 % and 5.5 %; shoulder widths by 21.0 % and 18.4 %;

- in patients with psoriasis men of *endo-mesomorphic somatotype* - higher values of body weight by 39.5 % (only for mild course); body length by 4.3 % (only for mild course); body surface area by 18.7 % (only for mild course); height of the thoracic anthropometric point by 5.5 % (only for mild course); height of acromial anthropometric point by 5.7 % (only for mild course); height of the finger anthropometric point by 9.3 % (only for mild course); transverse middle

thoracic diameter by 30.9 % and 17.1 %; transverse lower thoracic diameter by 31.2 % and 18.8 %; anterior-posterior middle thoracic diameter by 38.6 % and 18.0 %; interspinous distance by 17.2 % and 15.3 %; intercrystal distance by 15.1 % and 11.0 %; intertrochanteric distance by 12.8 % and 9.6 %; and lower values of the height of the trochanteric anthropometric point by 9.5 % and 7.2 %; shoulder width by 19.7 % and 23.4 %.

It should be noted that in most cases (more pronounced for mesomorphic somatotype) similar differences between healthy and psoriatic men were found by us in a study of

Ukrainian men without division into different somatotypes [12]. The only thing that attracts attention is, in most cases, the lack of significant or tendencies of differences between total and longitudinal body sizes between healthy and patients with severe psoriasis of endo-mesomorphic somatotype.

When comparing the total, longitudinal and transverse dimensions of the body between men with psoriasis of different somatotypes, it was found:

- in men with mild psoriasis - higher values in endo-mesomorphs of body weight by 24.6 %; body length by 3.5 %; body surface area by 12.7 %; height of acromial anthropometric point by 4.3 %; the height of the finger anthropometric point by 3.9 %; transverse middle thoracic diameter of 15.5 %; transverse lower thoracic diameter by 13.2 %; anterior-posterior middle thoracic diameter by 27.0 %;

- in patients with severe psoriasis - greater values in endo-mesomorphs only for interspinous distance by 4.3 %.

It should be noted that in most cases, we found significant somatotypological differences in total, longitudinal and transverse body size in patients with mild psoriasis in men are not present between practically healthy men (see Tables 1, 2).

When comparing the total, longitudinal and transverse dimensions of the body between men with psoriasis of the corresponding somatotypes, higher values of body length by 1.6 %, height of the thoracic anthropometric point by 1.5 % and height of the acromial anthropometric point by 1.6 % in mesomorphic somatotype with a mild course of the disease, as well as anterior-posterior middle thoracic diameter by 7.2 % in mesomorphic somatotype with a severe course of the disease.

In an anthropometric survey of 113 children with psoriasis and 113 healthy children in Kabul (Afghanistan), researchers found that children with psoriasis had higher body weight and central obesity than children in the control group (27.4 % vs. 12.4 %, OR=2.67; p=0.005 and 23 % vs. 9.7 %, OR=2.77; p=0.007, respectively). In addition, sick children had higher family history of skin diseases (23.0 % vs. 13.7 %; p<0.001) [1]. The importance of such a factor in the development of psoriasis as body weight and the presence of obesity in children is emphasized by the results of other studies [21]. In a sample of 27 children who developed psoriasis within 1 or 2 years, 25 were overweight or obese [4].

At the same time, anthropometric examination of children with different forms of psoriasis did not reveal any relationship between weight and the presence of obesity and some form of psoriasis [18].

In adults, the relationship between psoriasis and the presence of overweight has also been found. According to the data of multifactor logistic regression analysis, with an increase in body mass index to 28 kg/m² the chances of

psoriasis increase to 43 %, and with ≥ 30 kg/m² to 71 % [10].

If we take into account such an indicator as waist circumference, the increase in waist circumference by 1.20 (95 % CI 1.16, 1.23) at S.D. 13.5 cm increased the chances of psoriasis and 1.30 (95 % CI 1.21, 1.39) - psoriatic arthritis [15].

The meta-analysis of 19 publications on the relationship between anthropometric indicators and psoriasis provided strong evidence that indicators such as the percentage of total body fat, the percentage of visceral fat, the percentage of muscle mass should be used to assess the risk of psoriasis [5]. A similar analysis by Chahoud J. and co-authors [8] of 14 publications also indicated the appropriateness of using the ratio of waist to human height to predict the occurrence of this pathology.

The results of a study of the Turkish population showed a link between the presence of psoriasis and waist circumference. In addition, it was found that the risk of psoriasis increases for women compared to men by 1.26 times [20]. Similarly, various groups of Norwegian scientists have found a connection with increased waist circumference [24, 26].

The analysis of foreign literary scientific sources revealed that most of the works used mostly homogeneous and few anthropometric indicators, such as waist circumference, hips, weight and body height. At the same time, work on a complex variety of anthropometric data or type of somatotype has not been identified, which indicates a fundamentally new and atypical nature of the study, which could potentially open a new branch of research to study the relationship between anthropometric indicators and psoriasis.

Conclusions

1. In patients with mild and severe psoriasis men of mesomorphic somatotype, almost all total, transverse (except shoulder width) and more than half of the longitudinal body sizes is larger than in healthy men; and in patients with psoriasis, men of endo-mesomorphic somatotype larger than in healthy men - all total (only with a mild course), more than half of the longitudinal (only with a mild course) and almost all transverse (except shoulder width) body sizes.

2. In men of endomorphomorphic somatotype of patients with mild psoriasis, higher values of all total, almost half of the longitudinal dimensions of the body and almost all diameters of the torso; and in patients with severe psoriasis - only interspinous distance.

3. Only in men of mesomorphic somatotype with mild psoriasis, compared with severe psoriasis, greater values of body length, height of suprathoracic and acromial anthropometric points and lower values of anterior-posterior middle thoracic diameter are found.

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ТОТАЛЬНІ, ПОЗДОВЖНІ І ПОПЕРЕЧНІ РОЗМІРИ ТІЛА У ХВОРИХ НА ПСОРИАЗ ЧОЛОВІКІВ РІЗНИХ СОМАТОТИПІВ

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Використання конституціонального підходу з метою передбачення виникнення того чи іншого захворювання може стати ключем не тільки до вирішення проблеми пізнього початку терапії модифікації образу життя але і розуміння глибинних, не зрозумілих на перший погляд зв'язків між органами і будовою тіла людини. Мета дослідження - встановити та провести аналіз відмінностей тотальних, поздовжніх і поперечних розмірів тіла між здоровими та/або хворими на псоріаз чоловіками

різних соматотипів в залежності від тяжкості перебігу захворювання. Українським чоловікам (віком від 22 до 35 років) хворим на псоріаз (n=100, серед яких 32 із легким перебігом і 68 із тяжким перебігом) проведено антропо-соматотипологічне обстеження. За допомогою індексу PASI проведено клінічну оцінку важкості перебігу та площі псоріатичних уражень. Контролем слугували антропометричні дані 82 практично здорових чоловіків аналогічної вікової групи з банку даних науково-дослідного центру Вінницького національного медичного університету ім. М.І. Пирогова. Статистична обробка отриманих результатів проведена в ліцензійному пакеті "Statistica 5.5" із використанням непараметричних методів оцінки. У хворих на псоріаз легкого і тяжкого перебігу чоловіків мезоморфного та ендо-мезоморфного соматотипів порівняно зі здоровими чоловіками відповідних соматотипів встановлені більші значення практично всіх тотальних (окрім ендо-мезоморфів із тяжким перебігом захворювання), поперечних (окрім, ширини плечей) та більш ніж половини поздовжніх розмірів тіла (окрім ендо-мезоморфів із тяжким перебігом захворювання). У хворих на псоріаз чоловіків ендо-мезоморфного соматотипу з легким перебігом захворювання встановлені більші, ніж у хворих із аналогічним перебігом захворювання чоловіків мезоморфного соматотипу, маса тіла, довжина та площа поверхні тіла, висота акроміальної та пальцевої антропометричних точок, а також поперечний середньогруднинний, нижньогруднинний діаметри та передньо-задній середньогруднинний діаметр; а у хворих на псоріаз чоловіків ендо-мезоморфного соматотипу з тяжким перебігом захворювання - лише більші значення, ніж у хворих із аналогічним перебігом захворювання чоловіків мезоморфного соматотипу, міжостової відстані. При порівнянні тотальних, поздовжніх і поперечних розмірів тіла між хворими на псоріаз чоловіками відповідних соматотипів, у представників мезоморфного соматотипу з легким перебігом захворювання встановлені більші, ніж із тяжким перебігом, значення довжини тіла, висоти надгруднинної та акроміальної антропометричних точок, а також менші значення передньо-заднього середньогруднинного діаметра. Виявлені виражені відмінності тотальних, поздовжніх і поперечних розмірів тіла між здоровими та/або хворими на псоріаз легкого або тяжкого перебігу українськими чоловіками мезоморфного та ендо-мезоморфного соматотипів надають можливість підвищити ефективність застосування показників будови та розмірів тіла для виявлення груп ризику, щодо виникнення та особливостей перебігу псоріазу.

Ключові слова: псоріаз, тотальні, поздовжні та поперечні розміри тіла, соматотип, чоловіки.
