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TRANSVERSE BODY DIMENSIONS IN UKRAINIAN MEN AND WOMEN WITH VARIOUS FORMS OF URTICARIA

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In young Ukrainian men and women with acute and chronic urticaria of a mild and severe course, reliable or trends of differences in the transverse dimensions of the chest, shoulder width and pelvic dimensions from practically healthy Ukrainian men and women of the same age were established. Between the corresponding groups of sick men or sick women, only a few reliable or trends of differences in the transverse dimensions of the body were established. Pronounced manifestations of sexual dimorphism of the transverse dimensions of the body were established – in all groups of male patients, shoulder widths were significantly larger, as well as in men with severe acute and chronic urticaria, larger values of all chest diameters; and in patients with acute urticaria of a mild course in women – significantly larger values of all pelvic distances.

Key words: skin diseases, urticaria, skin diseases, urticaria, Ukrainian men and women, transverse dimensions of the body, sex differences.

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ОСОБЛИВОСТІ ПОПЕРЕЧНИХ РОЗМІРІВ ТІЛА В УКРАЇНСЬКИХ ЧОЛОВІКІВ І ЖІНОК, ХВОРИХ НА РІЗНІ ФОРМИ КРОПИВ'ЯНКИ

В українських чоловіків і жінок молодого віку, хворих на гостру та хронічну кропив'янку легкого і тяжкого перебігу, встановлені достовірні або тенденції відмінностей поперечних розмірів грудної клітки, ширини плечей та розмірів тазу від практично здорових українських чоловіків і жінок аналогічного віку. Між відповідними групами хворих чоловіків або хворих жінок встановлені лише поодинокі достовірні або тенденції відмінностей поперечних розмірів тіла. Встановлені виражені прояви статевого диморфізму поперечних розмірів тіла – в усіх групах хворих чоловіків достовірно більші значення ширини плечей, а також у чоловіків хворих на гостру та хронічну кропив'янку тяжкого перебігу більші значення усіх діаметрів грудної клітки; а у хворих гостру кропив'янку легкого перебігу жінок – достовірно більші значення усіх відстаней таза.

Ключові слова: шкірні захворювання, кропив'янка, українськи чоловіки та жінки, поперечні розміри тіла, статеві розбіжності.

The study is a fragment of the research project "The latest aspects of diagnosis, course, development and implementation in practice modern methods of chronic dermatoses and STDs complex treatment", state registration No. 0119U000712.

Urticaria is a skin disease that is manifested by the appearance of red or pale pink blisters (papules) on the skin, which are accompanied by itching. Blisters can be of various sizes and usually appear suddenly. This disease can have an acute or chronic course [10]. The main mechanisms of development include the activation and degranulation of mast cells and the release of histamine and other inflammatory mediators. Autoimmune processes can play a role in the development of the disease, especially in cases where chronic urticaria has an autoimmune nature [12].

The overall prevalence of chronic urticaria among adults worldwide is 1.4 % (95 % CI: 1.0–1.8%). For children, the prevalence is slightly lower and is 0.8 % (95 % CI: 0.5–1.1%). Regional differences in the prevalence of the disease are significant – the highest prevalence of chronic urticaria among adults is observed in Asia (1.7 %) and Europe (1.7 %), while the lowest is in the Americas (0.8 %). Age differences are also significant: the incidence of chronic urticaria increased with age. Sex differences have shown that women have a higher risk of developing chronic urticaria than men, with a female-to-male ratio of approximately 2:1 [6].

There is an increase in the incidence of urticaria both among the interrogated and especially among children. In low-income regions, urticaria has a significantly greater impact on public health, which may be related to limited access to medical services and higher levels of stress and environmental pollution [7].

The quality of life in patients with chronic urticaria is significantly reduced, which was confirmed by high scores on the DLQI (Dermatology Life Quality Index) and CU–Q2oL (Chronic Urticaria Quality of Life Questionnaire) scales. Patients with poorly controlled urticaria (as measured by UAS7, which assesses urticaria activity over the past 7 days) have significantly lower quality of life scores compared to

those with well-controlled disease. It is worth noting that patients spend a lot of money on treatment and medical examinations, which emphasizes the importance of proper disease control to reduce the financial burden [5]. Patients often experienced anxiety, depression, and stress, which was associated with the unpredictability of urticaria attacks, as well as the emotional and social discomfort caused by the disease [8].

Given the significant prevalence and severity of the disease, which is manifested in the influence of the psycho-emotional state of the patient. It is important to create mechanisms for early detection of the risk of this pathology.

The purpose of the study was to determine the peculiarities of the transverse dimensions of the body in young Ukrainian men and women with acute and chronic urticaria of a mild and severe course.

Materials and methods. On the basis of the department of skin and venereal diseases with a post-graduate course of National Pirogov Memorial Medical University, Vinnytsya and the Military Medical Clinical Center of the Central Region, the transverse dimensions of the body were determined (according to the scheme of V. V. Bunak [2]) of 40 Ukrainian men and 40 women of young age (25–44 years according to WHO age periodization, 2015) patients with acute (AU) and chronic (CU) urticaria of mild (MU) and severe (SU) course. Committee on Bioethics of National Pirogov Memorial Medical University, Vinnytsya (protocol No. 11 From 23.12.2021) 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.

The diagnosis of urticaria was made in accordance with the EAACI/GA²LEN/EuroGuiDerm/APAAACI international guidelines for the definition, classification, diagnosis and treatment of urticaria (https://pubmed.ncbi.nlm.nih.gov/29336054/).

Transverse and deep anterior-posterior diameters of a certain body segment were measured between its extreme points with a large caliper (width of shoulders, chest, pelvis).

As a control group, the transverse body dimensions of practically healthy Ukrainian men (n=82) and women (n=101) of the same age group were used, which were taken from the data bank of the research center of the National Pirogov Memorial Medical University, Vinnytsya.

The statistical analysis of the obtained results was carried out in the license package “Statistica 6.0” using non-parametric estimation methods. The nature of the distributions for each of the obtained variation series, the average for each characteristic being studied, and the standard square deviation were evaluated. The significance of the difference in values between independent quantitative values was determined using the Mann-Whitney U-test.

Results of the study and their discussion. It was established that the transverse mean thoracic diameter is significantly larger in men with AU/MU (31.50±2.59 cm, $p<0.001$), AU/SU (32.50±2.95 cm, $p<0.001$), CU/MU (30.40±2.22 cm, $p<0.05$) and CU/SU (31.00±4.24 cm, $p<0.05$) compared to healthy men (28.35±2.19 cm) (Fig. 1-A). The value of this indicator is significantly higher or tends to higher values in women with AU/MU (30.10±4.01 cm, $p<0.001$), AU/SU (27.70±2.36 cm, $p<0.01$), CU/MU (29.40±3.44 cm, $p<0.001$) and CU/SU (26.90±3.73 cm, $p=0.065$) compared to healthy women (25.21±1.72 cm) (see Fig. 1-A). When comparing the transverse mean chest diameter between the respective groups of male and female patients, significantly higher values were established in male patients with AU/SU ($p<0.01$) and CU/SU ($p<0.05$) (see Fig. 1-A).

Transverse inferothoracic diameter is significantly larger in men with AU/MU (28.80±3.01 cm, $p<0.001$), AU/SU (29.40±2.59 cm, $p<0.001$), CU/MU (28.00±1.70 cm, $p<0.001$) and CU/SU (28.90±3.41 cm, $p<0.001$) compared to healthy men (25.30±2.26 cm) (Fig. 1-B). The value of this indicator is significantly higher in women with AU/MU (27.50±3.84 cm, $p<0.001$), AU/SU (24.80±2.15 cm, $p<0.001$), CU/MU (26.90±3.93 cm, $p<0.001$) and CU/SU (25.40±2.22 cm, $p<0.001$) compared to healthy women (22.01±1.93 cm) (see Fig. 1-B). When comparing the transverse lower thoracic diameter between the respective groups of male and female patients, significantly higher values were established in male patients with AU/SU ($p<0.01$) and CU/SU ($p<0.05$) (see Fig. 1-B).

The anterior-posterior mean sternal diameter is significantly larger in men with AU/MU (23.40±3.44 cm, $p<0.001$), AU/SU (24.70±2.45 cm, $p<0.001$), CU/MU (23.50±2.76 cm, $p<0.001$) and CU/SU (24.60±3.98 cm, $p<0.001$) compared to healthy men (19.93±2.12 cm) (Fig. 1-C). The value of this indicator is significantly higher in women with AU/MU (24.60±4.25 cm, $p<0.001$), AU/SU (20.00±2.79 cm, $p<0.001$), CU/MU (23.20±4.44 cm, $p<0.001$) and CU/SU (21.10±2.85 cm, $p<0.001$) compared to healthy women (17.11±1.41 cm) (see Fig. 1-C). In addition, the value of the anterior-posterior midthoracic diameter is significantly greater ($p<0.05$) in women with AU/MU compared to women with AU/SU (see Fig. 1-C). When comparing the anterior-posterior midthoracic diameter between the respective

groups of male and female patients, significantly higher values were established in male patients with AU/SU ($p<0.01$) and CU/SU ($p<0.05$) (see Fig. 1-C).

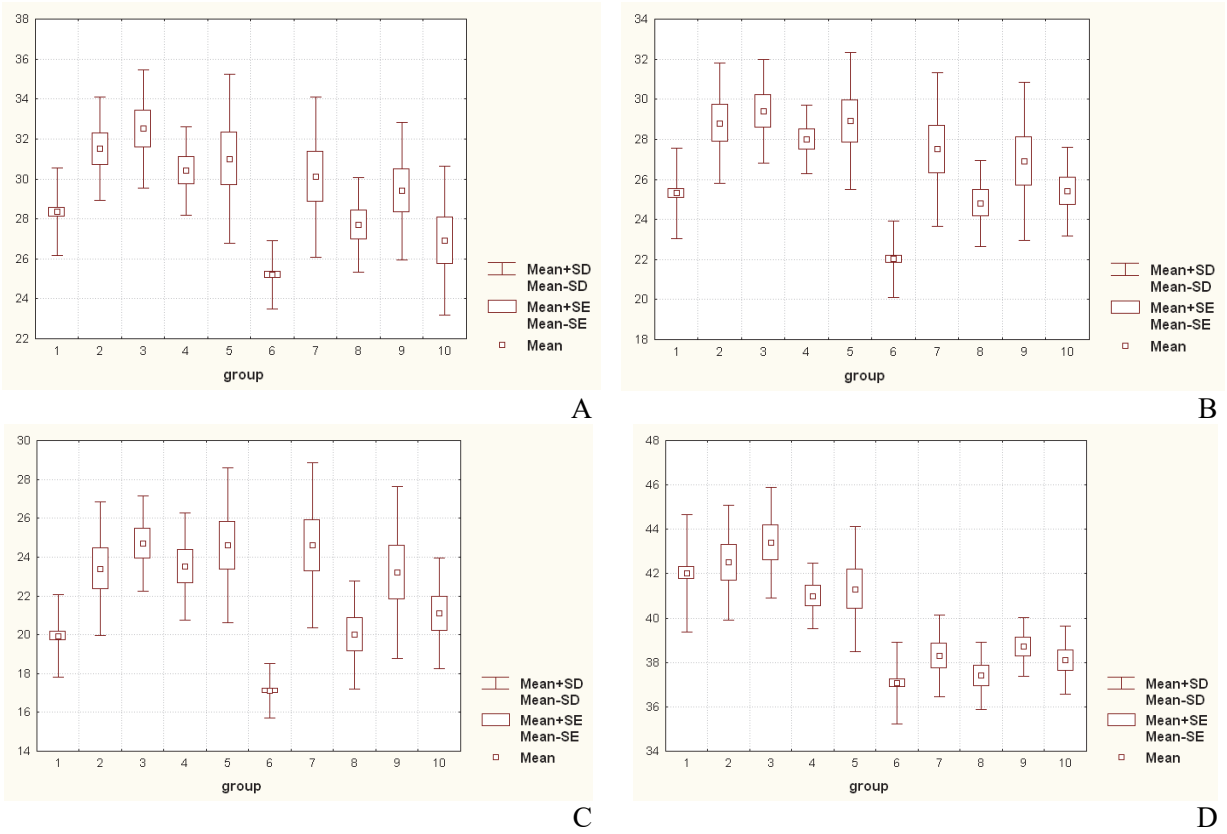

Fig. 1. Transverse and deep anterior-posterior trunk diameters in healthy men and women with urticaria (cm). A – transverse mean thoracic diameter; B – transverse lower thoracic diameter; C – anterior-posterior mean sternal diameter; D – shoulder width. Notes: in this and the following figure, 1 – healthy men; 2 – men with AU/MU; 3 – men with AU/SU; 4 – men with CU/MU; 5 – men with CU/SU; 6 – healthy women; 7 – women with AU/MU; 8 – women with AU/SU; 9 – women with CU/MU; 10 – women with CU/SU; group – corresponding groups of examined men and women; Mean – average value; Mean±SE – mean value ± error of the mean; Mean±SD – average value ± standard deviation.

Shoulder width has a pronounced tendency to greater values in men with AU/SU (43.40±2.50 cm, $p=0.051$) compared to healthy men (42.02±2.64 cm) (Fig. 1-D). The value of this indicator is significantly higher or has a slight tendency to higher values in women with AU/MU (38.30±1.83 cm, $p=0.080$) and CU/MU (38.70±1.34 cm, $p<0.01$) compared to healthy women (37.08±1.85 cm) (see Fig. 1-D). In addition, shoulder width tends to be greater ($p=0.076$) in male patients with AU/SU compared to male patients with CU/SU (41.30±2.83 cm) (see Fig. 1-D). When comparing the width of the shoulders between the respective groups of male and female patients, significantly larger values were established in male patients with AU/MU (42.50±2.59 cm, $p<0.01$) and CU/MU (41.00±1.49 cm, $p<0.01$), as well as in male patients with AU/SU ($p<0.001$) than in female patients with AU/SU (34.70±1.51 cm) and in male patients with CU/SU ($p<0.05$) than in female patients with CU/SU (38.10±1.52 cm) (see Fig. 1-D).

It was established that the interspinous distance is significantly greater in men with AU/SU (28.00±1.49 cm, $p<0.01$) compared to healthy men (26.33±1.98 cm) (Fig. 2-A). The value of this indicator is significantly higher in women with AU/MU (29.00±1.56 cm, $p<0.001$), AU/SU (27.00±1.70 cm, $p<0.01$), CU/MU (27.50±3.44 cm, $p<0.01$) and CU/SU (27.10±2.02 cm, $p<0.01$) compared to healthy women (24.98±2.18 cm) (see Fig. 2-A). In addition, the value of the interspinous distance is significantly greater ($p<0.05$) in women with AU/MU compared to women with AU/SU (see Fig. 2-A). When comparing the interspinous distances between the respective groups of male and female patients, significantly higher values were established in female patients with AU/MU ($p<0.05$) than in male patients with AU/MU (26.70±2.06 cm) (see Fig. 2-A).

Intercristal distance tends to greater values in men with AU/SU (30.50±1.51 cm, $p=0.075$) compared to healthy men (29.38±2.02 cm) (Fig. 2-B). The value of this indicator is significantly higher in women with AU/MU (31.10±1.66 cm, $p<0.001$), AU/SU (29.60±1.84 cm, $p<0.05$), CU/MU (30.60±2.41 cm, $p<0.01$) and CU/SU (29.20±1.03 cm, $p<0.05$) compared to healthy women (27.87±2.31 cm) (see Fig. 2-B). In addition, the value of the intercristal distance is significantly greater ($p<0.05$) in men with AU/SU compared to men with CU/SU (29.00±1.05 cm) (see Fig. 2-B). When

comparing the intercristal distances between the corresponding groups of male and female patients, significantly higher values were established in female patients with AU/MU ($p<0.05$) than in male patients with AU/MU (29.30±2.06 cm) (see Fig. 2-B).

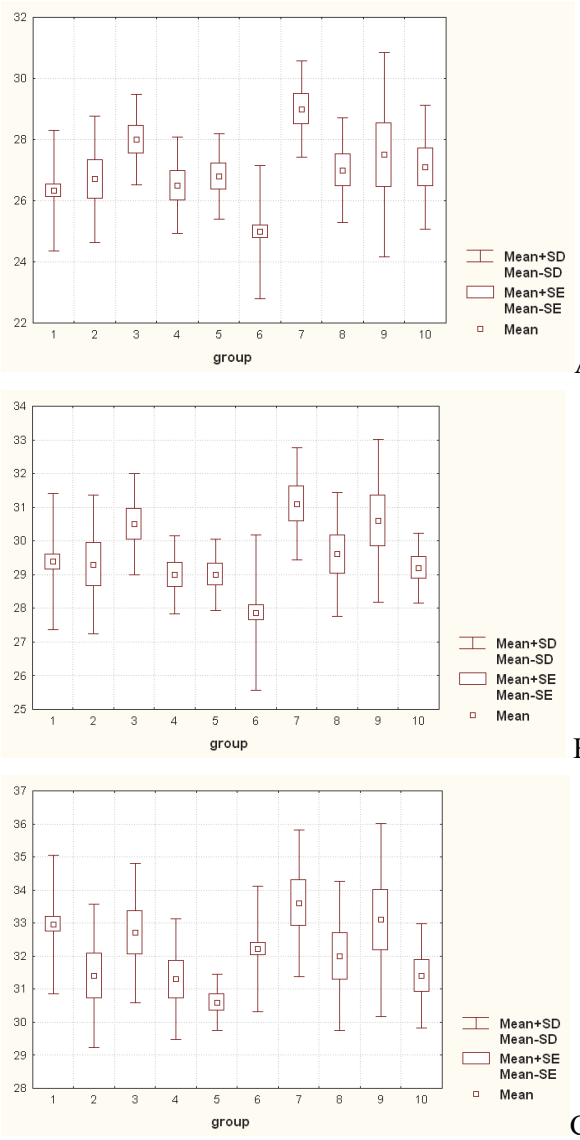

Fig. 2. Transverse diameters of the pelvis in healthy men and women with urticaria (cm). A – interspinous distance; B – intercristal distance; C – intertrochanteric distance.

Intertrochanteric distance is significantly smaller in male patients with AU/MU (31.40±2.17 cm, $p<0.05$), CU/MU (31.30±1.83 cm, $p<0.05$) and CU/SU (30.60±0.84 cm, $p<0.001$) compared with healthy men (32.96±2.10 cm) (Fig. 2-C). The value of this indicator tends to higher values in women with AU/MU (33.60±2.22 cm, $p=0.062$) compared to healthy women (32.22±1.89 cm) (see Fig. 2-C). In addition, the value of the intertrochanteric distance is significantly greater ($p<0.05$) in men with AU/SU (32.70±2.11 cm) compared to men with CU/SU (see Fig. 2-C). When comparing the intertrochanteric distances between the respective groups of male and female patients, significantly higher values were established in female patients with AU/MU ($p<0.05$) (see Fig. 2-C).

Thus, the value of transverse midthoracic, lower thoracic and anterior-posterior midthoracic diameters is significantly greater ($p<0.05–0.001$) in men with AU/MU (respectively by 11.11 % – 13.83 % – 17.41 %), AU/SU (respectively by 14.64 % – 16.21 % – 23.93 %), CU/MU (respectively by 7.23 % – 10.67 % – 17.91 %) and CU/SU (respectively by 9.35 % – 14.23 % – 23.43 %) compared to healthy men; and the width of the shoulders has only a pronounced tendency to higher values ($p=0.051$) in men with AU/SU (by 3.28 %).

It was also established that the value of transverse mid-thoracic, lower-thoracic and anterior-posterior mid-thoracic diameters is significantly greater ($p<0.05–0.001$) or tends to greater values ($p=0.065$) in women with AU / MU (respectively by 19.40 % – 24.94 % – 43.78 %), AU/SU (respectively by 9.88 % – 12.68 % – 16.89 %), CU/MU (respectively by 16.62 % – 22.22 % – 35.59 %) and CU/SU (respectively by 6.70 % – 15.40 % – 23.32 %) compared to healthy women; and shoulder width is significantly greater ($p<0.01$) or has a slight tendency to greater values ($p=0.080$) in women with AU/MU (by 3.29 %) and CU/MU (by 4.37 %).

When comparing trunk diameters between sick men and sick women, it was established that the value of the anterior-posterior midthoracic diameter is significantly greater ($p<0.05$) in women with AU/MU (by 18.70 %) compared to women with AU/SU; and shoulder width – has only a tendency to higher values ($p=0.076$) in men with AU/SU (by 4.84 %) compared to men with CU/SU.

When comparing the transverse midthoracic, lower thoracic and anterior-posterior midthoracic diameters between the respective groups of male and female patients, significantly higher values ($p<0.05–0.01$) were established in men with AU/SU (respectively by 17.33 % – 18.55 % – 23.50 %) and CU/SU (respectively by 15.24 % – 13.78 % – 16.59 %); and shoulder width is significantly greater ($p<0.05–0.001$) in men with AU/MU (by 10.97 %), AU/SU (by 16.04 %), CU/MU (by 5.94 %) and CU/SU (by 8.40 %).

It was also established that interspinous and intercristal distances are significantly greater ($p<0.01$) or have a tendency to greater values ($p=0.075$) in men with AU/SU compared to healthy men (respectively by 6.34 % – 3.81 %); and the intertrochanteric distance is significantly smaller ($p<0.05-0.001$) in men with AU/MU (by 4.73 %), CU/MU (by 5.04 %) and CU/SU (by 7.16 %) compared to healthy men.

In women with AU/MU, AU/SU, CU/MU and CU/SU, the value of interspinous and intercristal distances is significantly greater ($p<0.05–0.001$) compared to healthy women (respectively by 16.09 % – 8.09 % – 10.09 % – 8.49 % and by 11.59 % – 6.21 % – 9.80 % – 4.77 %); and the intertrochanteric distance has only a tendency to greater values ($p=0.062$) in women with AU/MU (by 4.28 %) compared to healthy women.

When comparing the pelvic distances between sick men and sick women, it was established that the value of intercristal and intertrochanteric distances in men with AU/SU is significantly greater ($p<0.05$ in both cases) compared to men with CU/SU (respectively by 5.17 % – 6.86 %); and the interspinous distance is significantly greater ($p<0.05$) in women with AU/MU (by 7.41 %) compared to women with AU/SU.

When comparing the interspinous, intercristal and intertrochanteric distances between the respective groups of male and female patients, significantly higher values ($p<0.05$ in all cases) were established in female patients with AU/MU (by 8.61 % – 6.14 % – 7.01 %, respectively).

A study by Kim et al. [9] found that high waist circumference, rather than high body mass index, may be a predictive risk factor for longer duration of chronic spontaneous urticaria. Patients with a significant waist circumference (≥90 cm for men and ≥85 cm for women) had a significantly longer mean disease duration (more than 2 years) compared to patients with a normal waist circumference. Importantly, body mass index alone did not show a significant effect on disease duration, which underscores the importance of monitoring waist circumference as a risk index.

A study by Oztop, Beyaz, and Orcen [11] examined the relationship between abdominal obesity and metabolic parameters in patients with chronic spontaneous urticaria. Analysis of the data showed that abdominal obesity was significantly more common in patients with urticaria compared to the control group.

A study of data from 11,261 patients with urticaria and healthy controls showed that patients have a significantly higher risk of developing metabolic syndrome compared to the general population. The frequency of metabolic syndrome in patients with urticaria was 37 %, which is significantly higher than the frequency in the general population. After adjustment for age, sex, body mass index and other risk factors, patients with chronic urticaria were found to have an increased risk of developing metabolic syndrome (OR=1.24, 95 %, CI=1.14–1.35) [13].

According to Aamir and co-authors [3], patients with chronic urticaria had an average body mass index of 27.16±3.82 kg/m², which was significantly higher compared to the control group, where the average body mass index was 23.28±2.61 kg/m² ($p<0.001$). The results of the study showed a positive correlation between an increased body mass index and the risk of developing chronic idiopathic urticaria, with a correlation coefficient of $r=0.42$ ($p<0.05$), which confirms the significance of this association.

A connection was found between anthropometric indicators and the risk of other dermatovenerological diseases, in particular, eczema. Among patients with eczema, a significantly greater thickness of skin folds was found compared to healthy men. The average thickness of skin folds on the triceps in patients with eczema was 12.4 mm, while in the control group this indicator was 8.6 mm, on the forearm 10.1 mm, and 6.5 mm, respectively. It was also found that patients with a chronic form of eczema have the greatest thickness of skin folds compared to other forms [4]. A study by Toizumi et al. [14] analyzed the relationship between asthma, rhinoconjunctivitis, eczema and perinatal anthropometric factors in Vietnamese children. Low maternal weight before pregnancy was associated with an increased risk of eczema in children (OR=1.26, 95 %, CI=1.02–1.56).

A connection with acne has also been found. In a study involving 97 teenagers with acne, in comparison with healthy young men and young women, it was found: lower values in sick young men of almost all (except skinfold thickness on the side) indicators of skinfold thickness (respectively from 8.1 to 40.3 % without taking into account the severity of the disease, from 8.7 to 40.2 % with a mild degree of disease severity and from 6.3 to 45.0 % with an average degree of disease severity); sick young women also have lower values of most (except for skinfold thickness on the back surface of the shoulder, on the side, and on the abdomen) skinfold thickness indicators (respectively, from 9.9 to 52.0 % without taking into account the degree of severity of the disease, from 12.1 to 49.9 % with a mild degree of severity of the disease and from 13.4 to 55.0 % with an average degree of severity of the disease) [1].

Conclusions

1. In patients with acute and chronic urticaria of a mild and severe course of Ukrainian men and women, the value of all chest diameters is significantly greater or tends to greater values (respectively, in men by 7.23 % – 23.93 %; in women – by 6.70 % – 43.78 %) compared to healthy men or women; shoulder width is significantly greater only in women with mild chronic urticaria (by 4.37 %). When comparing the

diameters of the chest between sick men or sick women, only in women with mild antero-posterior acute urticaria of the middle thoracic diameter (by 18.70 %) were found significantly higher values compared to women with severe acute urticaria.

2. Pronounced manifestations of sexual dimorphism of the transverse diameters of the chest were established – significantly higher values (by 15.24 % – 23.50 %) in men with severe acute and chronic urticaria, as well as shoulder width (by 5.94 % – 16.04 %) in all groups of sick men than in the corresponding groups of sick women.

3. In patients with acute and chronic urticaria of a mild and severe course in Ukrainian women, the interspinous and intercristal distances of the pelvis are significantly larger (by 4.77 % – 16.09 %) compared to healthy women; in patients with acute urticaria of a severe course in men, the intervertebral distance is significantly greater (by 6.34 %), and in patients with acute and chronic urticaria of a mild course and chronic urticaria of a severe course in men, the intertrochanteric distance is reliably smaller (by 4.73 % – 7.16 %) compared to healthy men. When comparing the diameters of the pelvis between sick men and sick women, it was established that in men with acute urticaria of a severe course, the intercristal and intertrochanteric distances are significantly larger (by 5.17 % – 6.86 %) compared to men with chronic urticaria severe course, and the interspinous distance is significantly greater (by 7.41 %) in women with mild acute urticaria compared to women with severe acute urticaria.

4. Manifestations of sexual dimorphism of pelvic dimensions were established only in patients with acute urticaria of a mild course – significantly larger values of all pelvic distances in women (by 6.14 % – 8.61 %).

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