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## CORRELATIONS OF BODY STRUCTURE AND SIZE INDICATORS WITH PERSONALITY INDICATORS OF PRACTICALLY HEALTHY WOMEN WITH ECTOMORPHIC SOMATOTYPE

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In practically healthy Ukrainian women of ectomorphic somatotype, multiple, mostly of medium-strength correlation of Shmishek character accentuation indices with the majority of head size and transverse body size and half the girth body size have been established; as well as scales of general internality, the level of subjective control, the level of subjective control in the field of achievement, in the field of family relations, in the field of educational (professional) relations and in the field of health and disease according to Rotter with most longitudinal, girth body sizes and indicators of the of skinfold thickness. Multiple medium strength correlations are established for cyclothymic, excitatory, and exalted accentuations character type by Shmishek with most longitudinal body sizes.

**Keywords:** correlations, healthy women of ectomorphic somatotype, personality indicators, anthropo-somatotypological indices.

## І.І. Андрієвський, О.А. Серебреннікова, А.В. Шаюк, В.В. Ковальчук, О.О. Ліхницький КОРЕЛЯЦІЇ ПОКАЗНИКІВ БУДОВИ ТА РОЗМІРІВ ТІЛА З ПОКАЗНИКАМИ ОСОБЛИВОСТЕЙ ОСОБИСТОСТІ ПРАКТИЧНО ЗДОРОВИХ ЖІНОК ЕКТОМОРФНОГО СОМАТОТИПУ

У практично здорових українських жінок екторморфного соматотипу встановлені множинні, переважно середньої сили зворотні зв'язки показників акцентуації характеру педантичного типу за Shmishek із більшістю розмірів голови й поперечних розмірів тіла та половиною обхватних розмірів тіла; а також шкали загальної інтернальності рівня суб'єктивного контролю, рівня суб'єктивного контролю в галузі досягнень, в галузі сімейних відносин, в галузі навчальних (професійних) відносин і в галузі здоров'я та хвороби за Rotter із більшістю поздовжніх, обхватних розмірів тіла та показників товщини шкірно-жирових складок. Множинні прямі середньої сили зв'язки встановлені для показників акцентуації характеру циклотимного, збудливого та екзальтованого типу за Shmishek із більшістю поздовжніх розмірів тіла.

**Ключові слова:** кореляції, здорові жінки екторморфного соматотипу, показники особливостей особистості, антропо-соматотипологічні показники.

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The concept of personality as a social and psychological image of man has gone through a long historical path of development – from the ancient period to the design of modern concepts of personality. Among modern concepts of personality, the leading place is occupied by the concept of 16 personality factors, and the most common way of thinking about personality is a hierarchical model of personality, representing the five main features that make up a person's personality and known as the Big Five: openness, conscientiousness, extraversion, agreeableness and neuroticism [10].

Researchers are increasingly interested in studying the relationship between anthropometric indicators and indicators of personality traits in different parts of the world. Sutin A. R. and Terracciano A. [15] in a sample of 5,150 people of different ages, sex, and nationalities found that higher body mass index (BMI) was associated with high levels of neuroticism, and low BMI was associated with conscientiousness, extraversion, and openness. Correlations were stronger in older women. There is a positive relationship between the ratio of width and height of the face in men and fearless dominance, the factor of egocentric impulsivity and general indicators of psychopathy [4].

Anthropometric parameters such as face width, lower face height, face height and filter length can be used as markers for predicting the development of treatment-resistant schizophrenia [13].

Thus, the search for and identification of relationships between indicators of structure and size of the human body and indicators of personality, taking into account gender, age and ethnicity is a promising research area and needs in the context of Ukrainian preventive medicine and supplementing theoretical knowledge of clinical anthropology.

**The purpose** of the study was to determine and analyze the correlations between indicators of body structure and sizes and personality indicators of practically healthy women with ectomorphic somatotype.

**Materials and methods.** Primary anthropo-somatotypological and personality indicators of practically healthy Ukrainian women aged 21 to 35 years of ectomorphic somatotype (n=22) were selected from the database of materials of the research center of National Pirogov Memorial Medical University, Vinnytsya.

All patients underwent an anthropometric examination according to Bunak V. V. [1]; somatotype determination – according to the scheme of J. Carter and B. Heath [7]; determination of body weight components – according to the formulas of J. Matiegka, and determination of the muscle component of body weight – by the method of the American Institute of Nutrition (AIN) [2].

In addition, all women with the help of personal questionnaires were assessed on the leading typological characteristics of temperament according to Eysenck; psychodynamic features of personality according to Spielberger C. D. in modification of Khanin Yu. L.; expressions and features of accentuated personality traits according to Shmishek G.; and components of internality according to Rotter J. in the modification of Bazhin E. F., Golinkina S. O. and Etkind O. M. [3].

The analysis of correlations between anthropo-somatotypological indicators and indicators of personality traits was performed in the license package “Statistica 6.1” using the non-parametric Spearman method.

**Results of the study and their discussion.** Among the leading typological characteristics of temperament according to Eysenck found that women of ectomorphic somatotype: *the index on the scale of extraversion-introversion (AZ\_E)* has significant mean feedback ( $r=0.51$ ) correlations with the ectomorphic component of the somatotype (LX); medium strength direct unreliable ( $r=$  from 0.31 to 0.42) correlations with the girth of the neck (OBSh) and waist (OBT), skinfold thickness (SFT) on the front surface of the shoulder (GPPL) and on the forearm (GPR), mesomorphic somatotype component (MX); moderate inverse unreliable ( $r=$  from 0.30 to 0.37) correlations with distal shin width (EPG) on crus (EPG), lower forearm girth (OBPR<sub>2</sub>) and foot (OBS), abdominal SFT (GG) and on the thigh (GBD); *the index on the scale of neuroticism (AZ\_N)* has a reliable medium-strength direct ( $r=0.51$ ) correlations with LX; reliable medium-strength feedback ( $r=$  from 0.42 to 0.57) with the lowest width (N\_SH\_GL), OBSh, breast SFT (GGR), GPPL and GPR; medium-strength direct unreliable correlations ( $r=0.31$ ) with pubic point height (ATL); medium-strength inverse unreliable ( $r=$  from -0.32 to -0.40) with facial width (SH\_LICA), OBT, transverse lower chest size (PNG), MX; *the insincerity scale index (AZ\_L)* has medium-strength direct unreliable ( $r=0.31$  and  $r=0.36$ ) correlations with the endomorphic component (FX) and the largest head length (B\_DL\_GL); medium-strength inverse unreliable ( $r=-0.30$  and  $r=-0.31$ ) correlations with SH\_LICA, WDE thighs (EPB).

Among the psychodynamic features of personality according to Spielberger found that in women of ectomorphic somatotype: *the situational (reactive) anxiety indicator (SP\_ST)* has a significant medium-strength direct ( $r=0.45$ ) correlations with LX; moderate inaccurate feedback ( $r=-0.36$ ) correlations with GGR; *the index of personal anxiety (SP\_LT)* has a reliable medium-strength direct ( $r=0.44$ ) correlations with the girth of the chest on inspiration (OBGK<sub>1</sub>); medium-strength direct unreliable ( $r=$  from 0.31 to 0.41) correlations with body length (H), acromial point height (ATPL), EPG, OBPR<sub>2</sub>, with chest girth on exhalation (OBGK<sub>2</sub>) and at rest breathing (OBGK<sub>3</sub>); crus SFT (GGL) and GBD, LX, with bone (OM) and fat mass (DM); moderate unreliable feedback ( $r=-0.31$ ) correlations with GGR.

Among the components of the assessment of the severity and features of accentuated personality traits by Shmishek found that women of ectomorphic somatotype: *the index of accentuation of character of hyperthymic type (SH\_G)* has medium strength direct unreliable ( $r=-0.43$  in both cases and  $r=-0.51$ ) correlations with OBPR<sub>2</sub>, GBD and LX; medium-strength inverse unreliable ( $r=-0.30$  and  $r=-0.37$ ) correlations with H, ATPL, interspinous distance (SPIN), GG and GGL, DM; *the index of accentuation of the character of the stuck type (SH\_Z)* has a reliable medium-strength direct ( $r=0.44$ ) correlations with GBD; significant mean force reverse ( $r=$  from -0.49 to -0.56) correlations with shoulder and forearm WDE (EPPR), EPB and OM; medium-strength direct unreliable ( $r=$  from 0.31 to 0.41) correlations with OBB, SFT on the side (GB) and GGL; medium-strength inverse unreliable ( $r=-0.31$  and  $r=-0.33$ ) correlations with OBS and GGR; *emotional character accentuation index (SH\_EM)* has a significant medium-strength direct ( $r=0.45$ ) correlations with GGL; significant mean feedback ( $r=-0.43$  and  $r=-0.45$ ) correlations with transverse mid-chest (PSG) and (PNG) chest sizes; medium-strength direct unreliable ( $r=$  from 0.34 to 0.42) correlations with the sagittal arch (SAG\_DUG), OBB, GG, GBD and DM; medium-strength inverse unreliable ( $r=-0.36$  and  $r=-0.33$ ) correlations with mandibular width (SH\_N\_CH) and lower part crus girth

(OBG<sub>2</sub>); *pedantry type accentuation index (SH\_P)* has significant strong feedback ( $r=-0.60$ ) correlations with intertrochanter distance (TROCH); significant mean inverse feedback ( $r=$  from  $-0.43$  to  $-0.58$ ) with N\_SH\_GL, hip girth (OB<sub>BB</sub>) and OBSH, shoulder width (ACR) and intercrystal distance (CRIS); medium-strength direct unreliable ( $r=0.32$ ) correlations with LX; medium strength inverse unreliable ( $r=$  from  $-0.30$  to  $-0.41$ ) correlations with SH\_N\_CH, maximum facial width (B\_SH\_GL) and SH\_LICA, body weight (W), unstressed shoulder girth (OBPL<sub>2</sub>), OBG<sub>2</sub>, OBT and hand girth (OBK), PSG and PNG, SPIN, GPPL, muscle mass (MM) and DM; *the index of character accentuation of the anxiety type (SH\_T)* has a reliable medium-strength direct ( $r=0.47$ ) correlations with LX; reliable medium feedback ( $r=$  from  $-0.44$  to  $-0.51$ ) correlations with N\_SH\_GL, EPPR, OBSH, PSG and TROCH, GPPL, GGR; medium-strength inverse unreliable ( $r=$  from  $-0.33$  to  $-0.41$ ) correlations with W, OBPL<sub>2</sub>, OBT, OB<sub>BB</sub>, OBK, PNG, GPR, MM; *the index of accentuation of character of cyclothymic type (SH\_C)* has reliable average force direct ( $r=0.46$ ) correlations with ATPL; reliable mean feedback ( $r=-0.48$  and  $r=-0.43$ ) correlations with N\_SH\_GL and PNG; medium strength direct unreliable ( $r=$  from  $0.30$  to  $0.39$ ) correlations with H, ATL and trochanteric point height (ATV), EPPL, OBGK<sub>1</sub>, anteroposterior chest size (SGK) and LX; moderate unreliable feedback ( $r=-0.31$ ) correlations with GGR; *the index of character accentuation of the demonstrative type (SH\_DM)* has reliable average feedback ( $r=$  from  $-0.44$  to  $-0.53$ ) correlations with OBPR<sub>2</sub>, GBD and LX; medium-strength inverse unreliable ( $r=-0.38$  and  $r=-0.31$ ) correlations with EPG and endomorphic component (FX); *the index of accentuation of the character of the excitable type (SH\_V)* has reliable medium-strength direct ( $r=0.45$  and  $r=0.48$ ) correlations with the height of the trochanteric point (ATV) and ATPL; significant medium-strength feedback ( $r=$  from  $-0.42$  to  $-0.47$ ) correlations with SH\_LICA, PNG and GGR; medium strength direct unreliable ( $r=$  from  $0.30$  to  $0.39$ ) correlations with H, upper sternal point height (ATND) and ATL, EPG, OBS, SGK, GG, LX; medium-strength inverse unreliable ( $r=-0.39$  and  $r=-0.30$ ) correlations with N\_SH\_GL and GPR; *the index of accentuation of character of dysthymic type (SH\_DC)* has reliable average strength direct ( $r=$  from  $0.44$  to  $0.54$ ) correlations with OBS, GG, LX; medium-strength direct unreliable ( $r=$  from  $0.30$  to  $0.38$ ) correlations with B\_DL\_GL, ATL, ATV, EPPL, OBPR<sub>2</sub>, GGL; medium-strength inverse unreliable ( $r=$  from  $-0.33$  to  $-0.35$ ) correlations with N\_SH\_GL, SH\_LICA and OBSH; *the index of character accentuation of the exalted type (SH\_EK)* has reliable medium-strength direct ( $r=$  from  $0.45$  to  $0.51$ ) correlations with ATPL, ATV, LX; medium strength direct unreliable ( $r=$  from  $0.32$  to  $0.48$ ) correlations with B\_DL\_GL, H, finger point height (ATP), ATND, ATL, EPPL, EPB, OBS, SGK, GG, OM; medium strength inverse unreliable ( $r=$  from  $-0.30$  to  $-0.39$ ) correlations with N\_SH\_GL, SH\_LICA, OBPL<sub>2</sub>, PNG, SPIN and MX.

Among the components of internality according to Rotter, it was found that in women of ectomorphic somatotype: *the index of the scale of general internality of the level of subjective control (USK\_1)* has significant strong feedback ( $r=-0.68$  and  $r=-0.60$ ) correlations with OB<sub>BB</sub> and DM; reliable medium strength feedback ( $r=$  from  $-0.44$  to  $-0.57$ ) correlations with W, H, ATND, ATL, ATPL, forearm girth in the upper part (OBPR<sub>1</sub>) and OBPR<sub>2</sub>, OB<sub>B</sub>, OBT, OBGK<sub>1</sub>, SFT on the back of the shoulder (GZPL) and GPPL, GL, MM; moderate inverse unreliable ( $r=$  from  $-0.30$  to  $-0.43$ ) correlations with ATP, EPPR, EPG, shoulder girth in a tense state (OBPL<sub>1</sub>) and shin in the upper part (OBG<sub>1</sub>), chest at rest (OBGK<sub>3</sub>), ACR, SPIN, CRIS, TROCH, GPR, GG, GB, GGL, FX, OM, muscle component of body weight (MA), which was evaluated by the method of the American Institute of Nutrition (AIN); *the index of the level of subjective control in the field of achievements (USK\_2)* has reliable average feedback ( $r=$  from  $-0.43$  to  $-0.48$ ) correlations with OBPL<sub>1</sub>, OBPR<sub>1</sub> and OBPR<sub>2</sub>, OB<sub>BB</sub>, OBGK<sub>1</sub>, SPIN, GL, DM and MA; medium strength inverse unreliable ( $r=$  from  $-0.30$  to  $-0.41$ ) correlations with W, H, ATND, ATPL and ATP, OBPL<sub>2</sub>, OB<sub>B</sub>, OBT, OBS, OBGK<sub>2</sub>, OBGK<sub>3</sub>, CRIS, TROCH, GG, GBD, GGL, MM; *the indicator of the level of subjective control in the field of failures (USK\_3)* has reliable average feedback ( $r=-0.43$  and  $r=-0.44$ ) correlations with OB<sub>B</sub>, GL; medium-strength direct unreliable ( $r=0.35$ ) correlations with surface conjugate (CONJ); medium-strength inverse unreliable ( $r=$  from  $-0.30$  to  $-0.42$ ) correlations with ATL, OBT, OB<sub>BB</sub>, OBGK<sub>1</sub>, GG, GGL, DM; *the index of the level of subjective control in the field of family relations (USK\_4)* has significant strong feedback ( $r=$  from  $-0.61$  to  $-0.67$ ) correlations with H, ATND, ATPL, ACR, MM and MA; reliable medium feedback ( $r=$  from  $-0.44$  to  $-0.54$ ) correlations with W, OBPL<sub>1</sub>, OBPL<sub>2</sub>, OBPR<sub>1</sub>, OB<sub>B</sub>, OBG<sub>1</sub>, OBT, OBVB, TROCH; medium inverse unreliable ( $r=$  from  $-0.30$  to  $-0.40$ ) correlations with N\_SH\_GL, SH\_N\_CH, ATL, ATP, EPB, OBPR<sub>2</sub>, OBK, OBGK<sub>1</sub>, PSG, GG, OM, DM; *the index of the level of subjective control in the field of educational (professional) relations (USK\_5)* has reliable strong feedback ( $r=-0.78$ ) correlations with OB<sub>BB</sub>; reliable medium-strength feedback ( $r=$  from  $-0.45$  to  $-0.52$ ) correlations with H, ATND, ATP, OBT, CRIS and TROCH, TJMS under the shoulder blade (GL), GPPL, GPR, DM; medium-strength direct unreliable ( $r=0.30$ ) correlations with SAG\_DUG; medium-strength inverse unreliable ( $r=$  from  $-0.31$  to  $-0.43$ ) correlations with N\_SH\_GL, W, ATL, ATPL,

OBPL<sub>1</sub>, OBB, OSSH, GZPL, GB, FX, MM, MA; the index of the level of subjective control in the field of interpersonal relations (USK<sub>6</sub>) has a reliable medium-strength direct ( $r=0.45$ ) correlations with B\_SH\_GL; medium-strength direct unreliable ( $r=$  from 0.30 to 0.38) correlations with N\_SH\_GL, SH\_LICA, W, OBG<sub>1</sub>, OBK, PSG, CRIS, TROCH, MM; the index of the level of subjective control in the field of health and disease (USK<sub>7</sub>) has significant strong feedback ( $r=-0.73$  and  $r=-0.63$ ) correlations with GPR, GGR; reliable medium feedback ( $r=$  from -0.46 to -0.58) correlations with SAG\_DUG, OSSH, OBT, OBBB, GPPL, GB, FX, DM; medium-strength inverse unreliable ( $r=$  from -0.31 to -0.40) correlations with W, H, ATND, OBPR<sub>2</sub>, OBB, GBD.

In the analysis of correlations between anthropo-somatotypological indicators and indicators of personality traits in practically healthy Ukrainian women of ectomorphic somatotype, the following multiple correlations were established: mostly the inverse of medium strength unreliable ( $r=$  from -0.30 to -0.41) and reliable ( $r=$  from -0.43 to -0.58) correlations of the index of accentuation of character of pedantic type according to Shmishek with the majority of cephalometric indices, half of the girth sizes, the majority of the transverse sizes of a body and muscular and fatty indicators of component structure of body weight; direct, medium-strength unreliable ( $r=$  from 0.30 to 0.40) and reliable ( $r=$  from 0.45 to 0.51) correlations with cyclothymic type, excitable and exalted Shmishek type accentuation indicators with most longitudinal body size and ectomorphic somatotype component; inverse, mostly of medium strength reliable ( $r=$  from -0.44 to -0.59) and unreliable ( $r=$  from -0.30 to -0.49) correlations, as well as in some cases inverse strong ( $r=$  from -0.60 to -0.78) of the indicators of the scale of general internality of the level of subjective control, the level of subjective control in the field of achievements, in the field of family relations, in the field of educational (professional) relations and in the field of health and disease according to Rotter with most longitudinal (except for the level of subjective control in the field of health and disease), girth body sizes (almost half for indicators of the level of subjective control in the field of educational (professional) relations and in the field of health and disease), indices of SFT and muscle and fat indicators of the component composition of body weight. In other cases, single direct and inverse, mostly of medium strength, unreliable correlations of body structure and size indices with leading typological characteristics of temperament, psychodynamic features of personality and indicators of expression and features of accentuated personality traits have been established.

In the quantitative analysis of reliable and average strength of unreliable correlations between body size and personality indicators of healthy women of ectomorphic somatotype, the following distribution of correlations was found:

- with the leading typological characteristics of temperament according to Eysenck 26 average strength correlations out of 171 possible (15.20 %), of which, 0.58 % direct reliable and 4.69 % direct unreliable and 3.51 % inverse reliable and 6.43 % inverse unreliable;
- with psychodynamic personality traits according to Spielberger 15 average strength correlations out of 114 possible (13.16 %), of which, 1.75 % direct reliable, 9.65 % direct unreliable and 1.75 % reverse unreliable;
- with indices of severity and features of accentuated personality traits according to Shmishek 130 strong and medium strength correlations out of 570 possible (22.81 %) of which, 2.28 % direct medium strength reliable and 7.19 % direct unreliable medium strength and 0.16 % reverse strong, 5.09 % reverse medium strength reliable and 8.07 % reverse unreliable medium strength;
- with indices of the level of subjective control by Rotter 148 strong and medium strength correlations out of 399 possible (37.09 %), of which, 0.25 % direct medium strength reliable and 3.01 % direct unreliable medium strength and 2.76 % reverse strong, 13.03 % reverse medium strength reliable and 18.05 % reverse unreliable average strength.

The connection between anthropometric indicators and features of the central nervous system is an indisputable fact. Thus, Jadoun B. S. and Chundawat M. S. as a result of analysis of data from 100 men revealed significant correlations between somatotype type and reaction rate. The fastest reaction was found in mesomorphic somatotypes, followed by ectomorphic and endomorphic somatotypes (8.31, 8.54 and 10.01, respectively) [12].

This knowledge is actively used in sports medicine. Indian researchers studied a sample of 240 people involved in water sports and land sports (control group) aged 18–25 years. These individuals underwent anthropometric study and determined personality traits by the method of John and Srivastava. The results of the study revealed a positive relationship between such personality indicators as good faith and endomorphic, mesomorphic and ectomorphic somatotype in water players. Endomorphic water players have greater features of good faith compared to the mesomorphic and ectomorphic somatotype. Mesomorphs had a greater conscientiousness compared to other types of somatotype. Non-aqueous players

had a negative correlation of good faith with endomorphic and ectomorphic somatotypes. A positive correlation between good faith and mesomorphic somatotype was revealed. Mesomorphic non-aqueous players are more conscientious than other somatotypes [11].

A group of Korean authors led by Shim U. [14] found that men with normal BMI compared with a group of men with excessive BMI have higher indicators of openness and lower integrity; women with high BMI have lower rates of neuroticism, openness, and higher levels of agreeableness compared to women with normal BMI. The rate of extraversion has a positive relationship with BMI in men ( $\beta=0.032$ ,  $p<0.05$ ); the index of neuroticism has a negative relationship with BMI in women ( $\beta=-0.026$ ,  $p<0.05$ ). The openness index has a negative relationship with BMI and waist circumference ( $\beta=-0.072$  and  $\beta=-0.202$ , respectively,  $p<0.05$ ).

There is a strong relationship between bizygomatic size in men and personality indicators [8] and the degree of slant of the forehead in men and indicators of temperament, character and impulsivity [9].

In comparing the features of the correlations of anthropometric indices with indices of personality in the general group of women without somatotype [5] or mesomorphic somatotype [6] with the results obtained in women of ectomorphic somatotype, there are differences in direction, type and strength of correlations, and the qualitative composition of indices for which the most pronounced common variability of the studied variables.

The established differences of correlations between mesomorphs and ectomorphs prove that each somatotype has its own not only external but also internal features, which are formed differently under the influence of an infinite number of factors. It is urgent to study the gradation of somatotyping parameters in a certain contingent of individuals from the standpoint of their psychological characteristics and somatotype, as well as to establish the degree of influence of morphofunctional status of the organism on temperament and behavior.

## Conclusions

1. In practically healthy Ukrainian women of ectomorphic somatotype, multiple, mostly inverse, medium-strength correlations are established – an index of accentuation of the character of the pedantic type according to Shmishek with most cephalometric indicators, half girth, most transverse body sizes and muscle and fat components of body weight; and indices of the scale of general internality of the level of subjective control, the level of subjective control in the field of achievement, in the field of family relations, in the field of educational (professional) relations and in the field of health and disease according to Rotter with most longitudinal, girth body sizes, indices of SFT and muscular and fatty indices of component structure of body weight; multiple medium-strength direct correlations – indices of accentuation of the character of the cyclothymic, excitable and exalted type according to Shmishek with the majority of longitudinal body sizes. In other cases, isolated direct and inverse, mostly of medium strength, unreliable correlations between indices of body structure and sizes with indicators of personality traits have been established.

2. As a result of the quantitative analysis of reliable and average force of unreliable correlations of indices of structure and the sizes of a body with indicators of personality features of practically healthy women of ectomorphic somatotype it is established that the percent of similar correlations fluctuates from 13.16 % with psychodynamic features of the person by Spielberger to 37.09 % with indices of level of subjective control by Rotter.

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## RISK MANAGEMENT OF COMPLICATIONS OF SURGICAL TREATMENT OF COLORECTAL CANCER BY CORRECTION OF THE HEMOSTASIS SYSTEM

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In 72 patients with verified colorectal cancer (T<sub>2-4</sub>N<sub>0-2</sub>M<sub>0-1</sub>), who were planned and performed surgical intervention in order to prevent complications, including thrombohemorrhagic complications, comorbid burden was studied according to the Charlson comorbidity index questionnaire and the results of study of hemostatic potential (low-frequency piezothromboelastography) after functional test with double local ischemia of the upper limb. The predicted relative risk of thrombohemorrhagic complications was high (relative risk  $r_{\text{THC}}=3.2$ ;  $p=0.017$ ). In the patients with III–IV stages of the disease, the results of low-frequency piezothromboelastography corresponded to the decompensated or depleted type of reaction of the hemostasis system ( $r=0.59$ ;  $p=0.036$ ). Depending on the disorders identified in the patients, the following were used: antiplatelet agents, direct anticoagulants, bioflavonoids, cofactors of the components of the coagulation system, antifibrinolytic drugs. The use of the developed prophylaxis regimens made it possible to reduce the incidence of postoperative complications, the total share of which was 8.4 %, including: pulmonary embolism occurred in 1.4 % of cases and hemorrhagic complications – in 2.8 %.

**Keywords:** prognosis, risk, complications, colorectal cancer, surgical treatment, low-frequency piezothromboelastography

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## УПРАВЛІННЯ РИЗИКАМИ УСКЛАДНЕНЬ ХІРУРГІЧНОГО ЛІКУВАННЯ КОЛОРЕКТАЛЬНОГО РАКУ ШЛЯХОМ КОРЕКЦІЇ СИСТЕМИ ГЕМОСТАЗУ

У 72 хворих з верифікованим колоректальним раком (T<sub>2-4</sub>N<sub>0-2</sub>M<sub>0-1</sub>), яким планувалося і було проведено хірургічне втручання, з метою профілактики тромбоембологічних ускладнень, визначено коморбідну обтяженість за опитувальником Charlson і результатами дослідження гемостатичного потенціалу (низькочастотна п'єзотромбоеластографія) після функціональної проби з подвійною локальною ішемією верхньої кінцівки. У хворих з III–IV стадією захворювання прогнозований відносний ризик був високим (відносний ризик тромбоембологічних ускладнень склав 3.2;  $p=0.017$ ), а результати дослідження гемостатичного потенціалу відповідали декомпенсованому, або виснаженому типу реакції системи гемостазу ( $r=0.59$ ;  $p=0.036$ ). Залежно від виявлених порушень у хворих під час лікування використовували: антиагреганти, прямі антикоагулянти, біофлавіноїди, кофактори компонентів системи згортання, антифібринолітичні препарати: у вигляді монотерапії та за комплексними схемами. Розроблені схеми профілактики дозволили зменшити частоту післяопераційних ускладнень, загальна питома вага яких склала 8.4 %: у 1.4 % випадків виникла тромбоемболія легеневої артерії і в 2.8 % – геморагічні ускладнення.

**Ключові слова:** прогноз, ризик, ускладнення, колоректальний рак, хірургічне лікування, низькочастотна п'єзотромбоеластографія

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The morbidity rate of colorectal cancer (CRC) is increasing annually in most countries of the world. In 2019, in Ukraine, its level was 19.6 ‰, the mortality rate was 10.7 ‰, in 52.5 % of cases CRC was diagnosed at stage III–IV [2]. According to WHO, CRC is one of the most common forms of tumor diseases, the mortality rate from which in the world reaches 800 thousand cases per year, and in the general structure of cancer mortality – 9.0 % [7].