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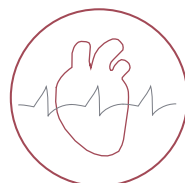
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Том Додаток

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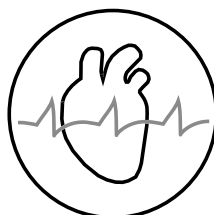
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Cardiovascular disease and comorbidity: retrospective evaluation of the charlson index and cumulative illness rating scale in patients with noncommunicable diseases at stages of the cardiovascular continuum

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Non-communicable diseases (NCDs) are a big unresolved social and health problem for the whole world. Cardiovascular disease (CVD) ranks first among NCDs as a cause of death and disability. CVD is an important component of comorbidity, which has its own Cardiovascular Continuum (CVC) (Dzau VJ & Braunwald E, 1991). CVD shares common risk factors and links of pathogenesis with other NCDs. At the same time, CVD never occurs in a healthy body: for the occurrence of CVD, metabolic changes in the body are necessary, which will become the basis of atherosclerosis, mitochondrial dysfunction, etc. Therefore, the aim of the study was to assess the place of CVD in comorbidity in patients with NCDs at the stages of the CVC. Materials and methods. 439 people were examined in an open, non-randomized, controlled study. 253 people (average age – 57.1±13.5 years; median age – 58(20.87) years; 54%(137/253) – men) were sick with NCDs (Main Group) and 186 people were functionally healthy respondents (Control Group – CG). The main group was divided into subgroup 1 (SG1) – patients with NCDs without CVD (n=70) and subgroup 2 (SG2) – patients with NCDs who had verified CVD (n=184). CVC with acute myocardial infarction was observed in 63 (87%) CSG2 patients. The control group was divided into subgroup 1 (CSG1) – functionally healthy professional athletes (n=75; (median age – 19(15; 34) years, 100%(75/75) – men)) and control subgroup 2 (CSG2) – functionally healthy individuals of young age (n=111; (median age – 23 (19;34) years, 78%(78/111) – men)), who do not systematically engage in sports and were not athletes before. All participants underwent a retrospective assessment of medical records, with the calculation of the history of diseases, assessment of the degree of comorbidity and determination of the stage of the Cardiovascular Continuum. The Charlson Index (CI) and Cumulative Illness Rating Scale (CIRS) have been calculated. All ethical and statistical rules were followed. Results. The results of comorbidity in groups were established: mean ChI was SG1 – 1±0.93, SG2 – 2.94±1.39, CSG1 – 0, CSG2 – 0; median ChI was SG1 – 1[0;4], SG2 – 3[1;5], CSG1

– 0, CSG2 – 0; mean CIRS was SG1 – 2.26±1, SG2 – 10.61±4.84, CSG1 – 0.8±0.8, CSG2 – 1.2±1.8; median CIRS was SG1 – 2[1;4], SG2 – 10[6;24], CSG1 – 1[0;2], CSG2 – 2[0;2]. The average number of diagnoses was: SG1 – 3.43±0.94, SG2 – 8.98±4.82, CSG1 – 0.1±0.4, CSG2 – 1.05±0.92; the median of diagnoses was SG1 – 3[3;7], SG2 – 9[8;15], CSG1 – 0.2[0;2], CSG2 – 1[0;3]. The indicator of the average number of diagnoses in SG1 was significantly lower (p<0.05) than in SG2, which indicates a lower level of comorbidity in the absence of CVD and, conversely, its increase in the clinical occurrence of CVC. In CSG1 and CSG2, the CIRS index was significantly (p<0.05) lower than in subgroups of the main group. At the same time, in SG1, the CIRS index was significantly lower (p<0.05) than in SG2, which also indicates a lower level of comorbidity in the absence of CVD and, conversely, its increase in the clinical occurrence of CVC. In all control subgroups, the ChI index was equal to zero, which indicated a statistical absence of mortality risk in the next 10 years in young functionally healthy individuals. In the subgroups of the main group, the ChI index increased from insignificant in SG1 to significant in SG1 (p<0.0001). It confirmed the fact of an increase in comorbidity and the risk of death from CVD when it occurs, as well as in the case of further progression of CVC and the occurrence of its complications.

Conclusions. 1) Since there was no monomorbidity in patients with NCDs, it can be argued that polymorbidity is the main feature of modern patients both with CVD and without CVD. 2) The highest average number of diagnoses, the highest indicators of CIRS, ChI indices were in SG2 – i.e. in the presence of complicated CVC. 3) CVD is part of polymorbidity in patients with NCDs (according to the dynamics of the CIRS), increases with CVC progression and increases the risk of death (according to the dynamics of the ChI indices).

Gender features of the pathogenesis of diabetes mellitus type 2 comorbidity with hypertension

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Nowadays 425 million people suffer from diabetes mellitus (DM). Diabetes mellitus is one of the most common diseases that affect all segments of population. The number of people with diabetes aged 20–79 years was predicted to rise to 642 million (uncertainty interval: 521–829 million) by 2040.

On a global scale, diabetes hits particularly 'middle aged' people between 40 and 59 years, which causes serious economic and social implications. Furthermore, diabetes affects especially low and middle income countries, as 77 % of all people with diabetes worldwide live in those countries. Diabetes mellitus is among ten leading causes of death in the world, killing about 1.6 million people a year, and is considered the third largest risk factor for premature death worldwide due to hyperglycemia, oxidative stress caused by hyperglycemia, and inflammation.

Objective – to study individual clinical and diagnostic characteristics in patients with type 2 diabetes mellitus with essential hypertension (DM + HD), taking into account gender.

Methods. We examined 41 patients with type 2 diabetes in combination with hypertension (21 men and 20 women) and 30 patients without diabetes with a history of hypertension (14 men and 16 women) and 20 healthy individuals. Clinical, laboratory, biochemical and statistical methods were used in dynamics of the study. All patients underwent a general clinical examination, which included collecting of complaints, anamnesis of illness and life, conventional physical research methods (examination, percussion and auscultation). Laboratory research included clinical blood and urine tests, daily urinary protein excretion; general biochemical – blood lipid spectrum, level of transaminases, glucose, urea and creatinine, blood uric acid concentration. Morphological changes in carotid vessels were assessed by quantitative echocardiography using an Ultima PA ultrasound scanner (Radmir, UA) with a linear probe with a frequency of 5–10 MHz. The examinations were carried out during hospitalization, while patients were under influence of regular antihypertensive therapy. Informed consent was obtained from all examined individuals to participate in the study and to use their bioassays. Statistical processing was performed using Student's t-test and Excel software.

Results. Systolic (SBP) and diastolic blood pressure (DBP) is significantly higher in patients with diabetes + HD compared with HD (in men, only DBP), and the ratio of early and late movement speed (E/A), heart rate did not change. The content of protein excreted in urine was below normal, which indicates an early stage of the pathological condition. The increased size of left atrium directly correlated with the end-diastolic size (higher in men), the thickness of the interventricular septum, and thickness of posterior wall (with DM + HD, higher in men). In men with DM + HD, the E/A was lower and the thickness of the intima-media complex of the right common carotid artery was higher than in the HD group. The ejection fraction was below normal.

Conclusions. In patients with diabetes mellitus comorbidity with hypertension and hypertension,

the semi-dimorphic differences of thickness of the interventricular septum, thickness of posterior wall, early and late movement speed, intima-media complex of right common carotid artery can be used to predict development of pathological process.

Telomerase activity in patients with cerebral atherosclerosis and diabetes mellitus

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The aim of our study is to determine the relationship between telomerase activity and lipid spectrum, structural and functional state of the heart and cerebral vessels and heart rate variability, as well as with telomere length in patients with stage 1–3 cerebral atherosclerosis (CA) and type 2 diabetes (T2D).

Study design: simple, prospective, non-randomized, with sequential inclusion of patients. The comprehensive clinical and instrumental study involved 161 patients with CA. Patients were divided into 2 groups: I – with CA of the 1st-2nd degree, II – with CA of the 3rd degree (after ischemic atherothrombotic stroke (IS)). Mean age = 65.1 ± 10.5 and 65.4 ± 9.1 years, respectively.

Results: to identify factors influencing telomerase activity, we used the method of constructing logistic regression models. When building models, the following categories were used: lower telomerase activity – $T/S < 3.16$ (low and medium tertiles); higher telomerase activity – T/S above 3.16. One-way regression analysis revealed one statistically significant ($p=0.02$) relationship between telomerase activity and male gender. To select a set of significant risk factors, the method of stepwise inclusion/exclusion of signs was used (Stepwise with an exclusion threshold $p>0.15$ and an inclusion threshold $p<0.03$). Based on the identified significant risk factors, a multivariate logistic regression model was built. A statistically significant positive relationship was established between telomerase activity and the HRV index, as well as a negative relationship with the atherogenicity index. A good agreement was found between the identified factor traits and the risk of a decrease in telomerase activity – $AUC=0.73$ (CI 0.63–0.83), which may indicate the completeness of the model and predictors of telomerase activity considered in this study.

Conclusions: Based on multivariate regression analysis, there was a correlation between telomerase activity and the atherogenicity index and the index of the total tension of the autonomic regulation of the heart rhythm in patients at different stages of CA, including those with type 2 diabetes ($AUC=0.73$ (95 % CI 0.63–0.83)).