FEATURES OF CYTOKINE PROFILE AND ENDOTHELIAL FUNCTION IN COMORBID COURSE OF ESSENTIAL HYPERTENSION

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Introduction. Appearance of the new terminology such as "endothelial dysfunction" and "chronic systemic inflammation" has designated a new round in the study of essential hypertension (EH), namely – to defining the role of the immune inflammatory mechanisms in the development and progression of vascular pathology [1, 6, 8]. It should be noted that the peculiarity of internal pathology at present time is its comorbidity [2, 9, 10], besides EH comorbidity worsens disease on the whole [3, 4]. Combination of EH with duodenal peptic ulcer (DPU) is frequent. It can complicate diagnostics, modify clinical symptoms and worsen treatment quality [7]. The foregoing formed basis of this study. The study aimed to identify the features of the changes of the cytokine profile and endothelial function in patients with EH and comorbid DPU.

Materials and methods. Totally 65 patients (35 males and 30 females) with second stage of EH (medication control) were examined; 32 of them had isolated EH (comparison group) and 33 patients (main group) had EH in combination with DPU (remission period). The study population had a mean age of 44,3±2,9 years. Reference indicators were obtained while studying 23 practically healthy individuals, sex and age of whome did not differentiate with those of examined patients.

Spectrophotometrical method was used to evaluate the indices of endothelial function: the level of ultimate stable metabolites of nitrogen oxide (Griss reagent) – nitrites (NO_2), nitrates (NO_3),their total content (NO_x) in blood serum and risk-marker of thrombogenic complications (according to ristomycin-induced platelet aggregation (RIPA) [5, 11]. Blood test for pro- (TNF-α, IL-1β, IL-6) and anti-inflammatory (IL-10) cytokines (Ck) was conducted by immunoenzyme method.

Results. Present study revealed that patients with comorbid EH (compared to reference data) had 1.5 times decreased level of NO_2, 1.6 times decreased level of NO_3 and 1.6 times decreased NO_x ($p<0.001$ in all cases). Unlike patients with isolated course of EH, in EH comorbidity RIPA not only exceeded 1.45 times reference data ($p<0.001$) and 1.12 times index of the comparison group($p<0.05$), but also the physiological threshold of this index on the whole, and, moreover, the inverse correlation was found between RIPA and NO_x ($r = -0.27$; $p<0.01$).

In patients of the main group an essentially increased level (in comparison with reference data) of Ck was revealed - TNF-α (2.6 times higher; $p<0.001$), IL-1β (2.3 times higher; $p<0.001$), IL-6 (1.6 higher; $p<0.001$) и IL-10 (1.3 higher; $p<0.05$). Noteworthy that absolute content of proinflamamtory Ck in the patients of the main group had been higher than in the comparison group: TNF-α – 1.5 times higher ($p<0.001$), IL-1β – 1.4 times higher ($p<0.05$), IL-6 – 1.3 times higher ($p<0.05$). At the same time, TNF-α/IL-10 index (almost twice higher ($p<0.001$) than in the reference data) was 1.3 times higer than in comparison group ($p<0.01$); IL-1β/IL-10 and IL-6/IL-10 indices exceeded reference data values 1.9 times higher ($p<0.001$) and 1.3 times higher ($p<0.05$), respectively. Patients of the main group had negative correllations between TNF-α and NO_x, IL-1β and NO_x ($r = -0.30$ and $r = -0.28$ accordingly; $p<0.01$) and their severity was higher than in patients of comparison group($r = -0.27$ and $r = -0.24$ accordingly; $p<0.01$). Direct correlation was found between TNF-α and RIPA ($r = +0.28$; $p<0.01$) as well as between RIPA and IL-1β ($r = +0.26$; $p<0.05$), they were more pronounced than in patients of the comparison group($r = +0.25$ and $r = +0.22$ respectively; $p<0.05$).

Conclusion. Patients with EH in conditions of comorbid course with DPU have changes of cytokine profile with predominance of pro-inflammatory Ck. Presence of correlation relationships between pro-inflammatory Ck and indices of endothelial dysfunction, pro-inflammatory Ck and risk-marker of thrombogenic complications reflect their community in the mechanisms of comorbid pathology formation. It should be considered as burdening criterion in conditions of comorbid course of EH and DPU.

Prospects for further research. Revealed features of the changes of immune and metabolic indices expect carrying out of further study of their connection with hemostasis factors for refinement of possible role in mechanisms thrombogenesis' development in the patients with comorbid course of EH.

Recommendations. It is necessary to take into account results of this study during stratification risk-factors in patients with EH in conditions of comorbid course.

Key words: essential hypertension, comorbidity, cytokine profile, endothelial function.

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