VARIABILITY OF ANTHROPOMETRIC, ECHOCARDIOGRAPHIC AND BIOCHEMICAL INDICES WITH COMORBIDITY PATHOLOGY – ESSENTIAL HYPERTENSION AND TYPE 2 DIABETES

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The mechanisms of development and progress of essential hypertension (EH) and concomitant type 2 diabetes (DM2) still remain not completely studied, so the comprehensive evaluation of the contribution of various indicators to the formation of this comorbidity have scientific interest.

The aim of this study was comprehensive assessment of the variability of anthropometric, echocardiographic and biochemical parameters in patients with EH and concomitant DM2.

Material and methods. We examined 243 patients aged 45-60 years. The main group consisted of 153 patients with EH stage II, grade 2 and DM2 moderate, subcompensated; comparison group - 70 patients with EH stage II, grade 2 without DM2. The control group consisted of 20 healthy individuals.

Methods: biochemical blood analysis, echocardiography evaluation of mitral diastolic blood flow and tissue Doppler spectral modes, reactive hyperemia, color Doppler mapping, enzyme immunometry. Integrated data processing was carried out with the help of factor analysis using principal component.

Results and their discussion.

In the analysis there were 73 variables, based on the relationships among which there were 4 factors that together explain 52.61% of the total variability of the empirical data. In this case the first and the most powerful factor explained 33.07% of the total variability of indices (Table 1). Among the variables there were some correlations - 41.17% of the fluctuations and changes observed in the empirical data, which were caused by two latent reasons of the highest level, that is, the influence of two factors (and four factors explained more than half of the variation).

Table 1

<table>
<thead>
<tr>
<th>Groups</th>
<th>Factors</th>
<th>Averaged factor estimates</th>
<th>Complex comparison groups</th>
<th>Significance difference between group factor estimates</th>
<th>Distance between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1</td>
<td>0.722 ± 0.019</td>
<td>Factor 2</td>
<td>0.695 ± 0.020</td>
<td>Factor 3 : 0.563</td>
<td>Factor 4 : 0.520</td>
</tr>
<tr>
<td>Factor 1</td>
<td>0.819 ± 0.014</td>
<td>Factor 2</td>
<td>0.850 ± 0.019</td>
<td>Factor 3 : 0.563</td>
<td>Factor 4 : 0.520</td>
</tr>
</tbody>
</table>

The highest load of factor 1 were at indicators DC, MDA, TNE-n, IL-6, blood glucose and insulin, HbA1c, HOMA, leptin, while at the negative pole of this factor were SOD, catalase, EDV, adiponectin, HDL cholesterol, GFR.

At the next stage we investigated intensity of factors in groups of patients and reliability of differences in factor group estimates (Table 2). Including the variables for Factor 1, it was found that the patients with EH and concomitant DM2 had metabolic disorders with severe endothelial dysfunction, which significantly differed the main group from the group of control and second comparison (p<0.001).

Analysis of the second important Factor 2 showed that the patients with EH with and without DM2 had changes in LV geometry that reliably differed the main group and the comparison group from the control one.

Table 2

Conclusions

1. We discovered 4 main factors, the general action of which explained 52.61% of variability indices in comorbid pathology - EH and DM2.

2. Factor assessment of the most powerful Factor 1 with high significance made the studied groups of patients differ from each other.

References

There is no conflict of interests