THE STUDY OF PSYCHOLOGICAL CHARACTERISTICS OF PATIENTS WITH VARIOUS FORMS OF ASThma ON THE BASIS OF STRUCTURAL DATA ANALYSIS

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Mathematical methods in medicine is a combination of quantitative research methods and objects state and behavior analysis of the systems that are related to medicine and health care. These methods allow to define type of bronchial asthma. They detect patterns characteristic of biomedical objects and identify the similarities and differences between groups of objects.

Key words:
Bronchial asthma, medical data structure, structural methods of analytical data.

Investigating the problem of the psychological and physiological characteristics of patients with various forms of asthma on the basis of structural data analysis is relevant today.

Bronchial asthma (BA) is a disease which belongs to the main group of psychosomatic pathology. [1] The health status of the population of all planet is one of the most significant values. Well-being of our society depends on public health.

Previously, the main role in this matter was assigned to medicine. However in the matter the integrated approach is required. To solve this task it is necessary to involve such sciences as psychology, statistics, mathematics and ecology. Many scientists engaged in research of psychology, philosophy, physiology speak about it in their scientific works. Among them are: I.A. Arshavsky, A.G. Asmolov, I.I. Brekhman, V.P. Zinchenko, J.P. Lisitsyn, etc.

The role of psychosocial and emotional factors in the development of asthma is estimated by various specialists as contradictory. Mechanisms of its emergence and development remain unclear. [1] Year by year there appear more and more medical and psychological studies dedicated to psychological factors, which influence the course of one or another disease.

The psychological factor is involved not only in the pathogenesis of the disease but it also changes the whole social situation. The illness changes the way of life and self-awareness of an individual, which can lead to the formation of abnormal and egocentric attitudes, protective and compensatory personal qualities. It aggravates the course of the disease and interferes with the effective treatment. [2]

The objects of research are patients with asthma. There are data on 42 asthmatics. Different physiological indicators as well as psychological test indicators are measured for every patient.

As initial information we have data on patients with four types of bronchial asthma (new classification):

1. BAPI is bronchial asthma psychogenic-induced;
2. BASP is bronchial asthma somato-psychogenic;
3. BANP is bronchial asthma non-psychogenic;
4. PD is psychogenic dyspnea.

The first (main) group, conditionally designated as BAPI consists of patients who had a stressful vital event.

In case when the course of the disease is not effected by various psychological factors, the patients referred to the third non-psychogenic group.

The additional second group in the comparative list are patients with somato-psychogenic asthma (BASP) which is a form at which the usual current of the bronchial asthma was altered by psychosocial stress. Asthma was accompanied by deterioration of the course of the disease and its recurrence after stressful events.
It is necessary to investigate psychological and physiological characteristics of each group. It will allow specifying the diagnosis and choosing a rational therapy.

**Computer analysis of the results of psychological researches**

At present, in the research connected with the study of the population psychological state, various mathematical and statistical methods of data analysis involving up-to-date information technologies are widely used.

Computer processing of data involves some mathematical transformation of data and visualization with the help of certain software. [3]

At the moment there are many different packages designed for the analysis of experimental data. The most famous are:

1. SAS;
2. SPSS;
3. SYSTAT;
4. Statgraphics (foreign).

The Statistica / W package is popular in Russia.

The computer is used for data processing, which allows to make difficult methods of data analysis more available and evident.

**The Luscher Color Test**

The Luscher Color Test is a psychological test, developed by Dr. Max Luscher. Luscher's color diagnostics allows to measure the psychophysiological state of person, one's resistance to stress, activity level, and communication skills. Luscher’s test allows to determine the causes of psychological stress, which can lead to physiological symptoms.

Luscher’s test is based on the experimental fact that our color preferences reflect our mood, functional condition, and the most stable personality traits. It is a "deep" test. We choose colors unconsciously. The psychological interpretation of colors was determined during multifaceted research of a large number of subjects.

Eight cards of different colors were displayed to patients with asthma. They chose a card of the color most pleasant to them at the moment. It was not allowed to associate the card color with that of their clothes or cars. After the choice was made the card would disappear. And then this was repeated until all the cards were sorted out.

The Luscher test method requires two selections:

- B1 – choice 1;
- H – card number (color).
- ABS – Audio visual stimulation.

**Correlation analysis of data in the STATISTICA software package**

STATISTICA is an integrated system for statistical analysis and data processing. [4]

The correlation analysis is an excellent analytical tool when it is implemented correctly. While learning to use this method, it is important to carefully specify the problem being studied, and the statistical methods being used.

Spearman's rank correlation coefficient is used for evaluation of the interconnection of indicators. The correlation matrices are built in the STATISTICA software package.
Table 1. Spearman’s rank correlation coefficient

<table>
<thead>
<tr>
<th>Spearman's rank correlation coefficient</th>
<th>Significance</th>
<th>$\alpha = 0.05$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before AVS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1H1-B2H1</td>
<td>0.64</td>
<td>significant</td>
</tr>
<tr>
<td>B1H2-B2H2</td>
<td>0.15</td>
<td>not significant</td>
</tr>
<tr>
<td>B1H3-B2H3</td>
<td>0.20</td>
<td>not significant</td>
</tr>
<tr>
<td>B1H4-B2H4</td>
<td>0.28</td>
<td>not significant</td>
</tr>
<tr>
<td>B1H5-B2H5</td>
<td>0.46</td>
<td>significant</td>
</tr>
<tr>
<td>B1H6-B2H6</td>
<td>0.40</td>
<td>significant</td>
</tr>
<tr>
<td>B1H7-B2H7</td>
<td>0.61</td>
<td>significant</td>
</tr>
<tr>
<td>B1H8-B2H8</td>
<td>0.86</td>
<td>significant</td>
</tr>
<tr>
<td><strong>After AVS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1H1-B2H1</td>
<td>0.71</td>
<td>significant</td>
</tr>
<tr>
<td>B1H2-B2H2</td>
<td>0.46</td>
<td>significant</td>
</tr>
<tr>
<td>B1H3-B2H3</td>
<td>0.46</td>
<td>significant</td>
</tr>
<tr>
<td>B1H4-B2H4</td>
<td>0.72</td>
<td>significant</td>
</tr>
<tr>
<td>B1H5-B2H5</td>
<td>0.76</td>
<td>significant</td>
</tr>
<tr>
<td>B1H6-B2H6</td>
<td>0.72</td>
<td>significant</td>
</tr>
<tr>
<td>B1H7-B2H7</td>
<td>0.75</td>
<td>significant</td>
</tr>
<tr>
<td>B1H8-B2H8</td>
<td>0.89</td>
<td>significant</td>
</tr>
</tbody>
</table>

**Conclusion**

The study of the correlation coefficients between the first and the second choice of the Luscher Color Test has shown that after AVS the correlation had improved. The number of significant Spearman’s rank correlation coefficient had increased.
The first choice in the Luscher Color Test is the desirable state, the second is the real one. Basing upon this it can be said that if the correlation between the first and the second choice is strong, the patient will be in a psychological balance. The reality suits this patient.

Thus, it can be seen that the patient's inner world changes depending on the role of psychological stress. Stress-dependent correlation is reflected, and the strongest correlation after AVS is found.

The psychological importance of AVS (influence on patient's psyche, formation of psychological balance) is displayed.

REFERENCES


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