IMPACT OF HUMAN PSYCHOLOGY ON THE DEVELOPMENT OF ASTHMA

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Abstract

The main goal of this article is a research of the psychological characteristics of people suffering from various bronchopulmonary diseases. For this purpose non-parametric statistical Mann-Whitney test is used. The study is based on the rates of psychological tests. Also a graph is presented according to the results of testing. Moreover, a table with the results of the Mann-Whitney test is shown. After analyzing all the results are concluded.

Keywords

Bronchial asthma, method of Mann-Whitney, dyspnea, Axis of significances, Cattell's test, psychological indicators, level of significance.

Introduction

Nowadays asthma is a cause of different types of disability, reducing of patients' social activity, and as a result, reducing of their life quality. To date, the incidence of asthma in the world is from 4 to 10% of the population. In Russia, according to various sources, the prevalence in the adult population ranges from 2.2 to 5.7%, and in children population, the rate is about 10%. The sad fact is that, in spite of scientific advances in the etiology and the availability of new drugs, the incidence and mortality from asthma are increasing. It is typical for most countries. Developing the disease depends on various factors, such as heredity, occupational, psychological, and many others. If heredity and occupation does not cause issues impact on the emergence and dynamics of the disease, the question of the role of psychological features still have to be asked and requires further research.

Neurotic reactions make a great influence on the patients with bronchial asthma. Emotional conflicts often cause the next exacerbation of asthma. In clinical practice, there are patients in whom the first catadrome occurred as a result of stress. Asthma is a classic multi-factorial disease with the interaction of physical, mental, psychological and environmental factors.

Literature Review

At present classification of asthma according to the forms of the disease is the most difficult issue for science. Specialists are often divided asthma according to such criteria as infectious, allergic, food, neuropsychiatric, Aspirin, dishormonal and many other species. With the development of knowledge in this area the classification of the disease is also changing. For example, Russian therapist S.P. Botkin divided asthma on catarrhal and reflex types; he believed that pathological reflexes in the nervous system cause asthma. But many specialists prefer to use an older classification, published in "Journal of Allergy" in 1945:

1. Atopic asthma.
2. Infectious-allergic asthma.
3. Mixed asthma.

On the West there are only two main types of asthma: exogenous asthma related to external factors and endogenously asthma related to internal causes. All previous proposed classifications implied the disease started because of viruses, heredity or bad environment. Today, some experts in the medical sphere offer to classify asthma on psychological grounds. But they can not create a general classification because of disagreements.

Methodology

Experts identify several types of asthma with different symptoms and disease progression. The experimental material is data based on parameters received from 100 patients [3]: physiological parameters before and after treatment (weight, lung capacity, peak expiratory flow volume, expiratory volume in 1 second, and so on), and psychological indicators (Cattell test, the degree of anxiety by Shihan, age of the patient during the first episode of the disease, the level of depression Beck, etc.). All patients were divided into groups according to the types of asthma:

- asthma not psychogenic (BANP);
- asthma somatosensory psychogenic (BASP);
- asthma induced psychogenic (BAPI).

In addition there is a group of patients with a diagnosis of dyspnea Psychogenic (PD).

The aim is to explore the psychological characteristics of people suffering from various bronchopulmonary diseases and then analyze the results. The research is based on results of Cattell test.

For solving such problems non-parametric statistical tests (Mann-Whitney test, sign test, Wilcoxon test, Kruskal-Wallis test, etc.) are traditionally used [1]. The choice of the criteria is determined by the characteristics of the experimental material and the limitations of these criteria. All of them are used for all kinds of research with dependent or independent samples.

To solve this problem the Mann-Whitney test was selected. It is used to assess differences between two samples. [2] The essence of this method is that it shows how small the area of overlapping values between two series is. Lower value of the criterion means that the differences between the parameters' values in the sample are correct.

As a result two hypotheses are formulated:

H0: The level feature in group 2 is not lower than the level feature in Group 1.

H1: The level feature in group 2 is lower than the level feature in Group 1.

Figure 1 shows the "axis of importance" for a decision by the Mann-Whitney test.
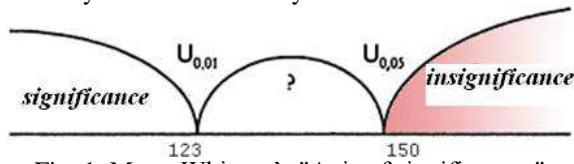

Fig. 1. Mann-Whitney's "Axis of significances"

It should be noted that the scheme of making decision for the Mann-Whitney test differs from the conventional schemes for most statistical criteria [2].

Figure 2 shows the personal profiles (in terms of Cattell test) for all available groups.

Results

Applying of this criterion allowed revealing of significant differences in the level of psychological parameters between existing surveyed groups (patients with various forms of asthma.) The results are shown in the table 1.
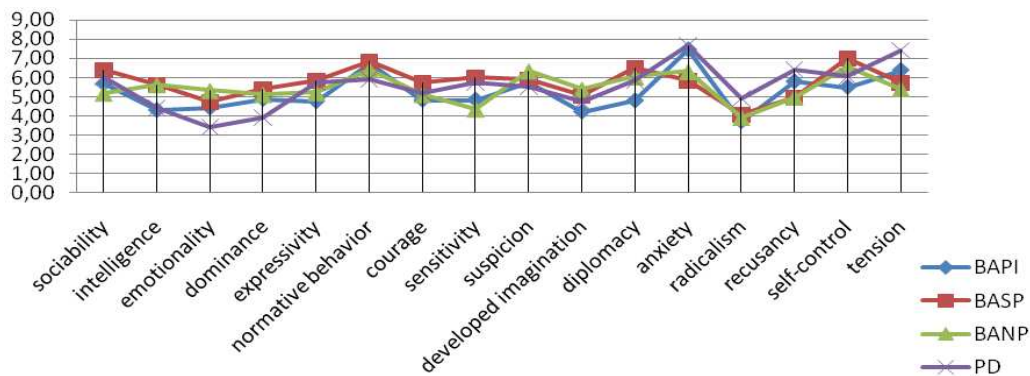

Fig. 2. Schedule of personal profiles of groups in terms of test Cattell

Table 1. Performance with a high level of significance

Diagnosis	BASP	BANP	PD
BAPI	intelligence (p<0.05) sensitivity (p<0.05) diplomacy (p<0.01) anxiety (p<0.05) recusancy (p<0.05) self-control (p<0.05) reliability (p<0.05) By Beck Depression (p<0.05)	anxiety (p<0.05) tension (p<0.05) Depression (p<0.05) paranoia (p<0.05) schizophrenia (p<0.05) personal anxiety (p<0.01) Alarm by Shihan (p<0.01) By Beck Depression (p<0.01)	tension (p<0.05) By Beck Depression (p<0.01) alexithymia (p<0.01) Depression by Tsung (p<0.05)
BASP		sensitivity (p<0.05) hypochondria (p<0.01) paranoia (p<0.01) «suppression» (p<0.01) personal anxiety (p<0.01) Alarm by Shihan (p<0.01)	emotionality (p<0.05) dominance (p<0.05) anxiety (p<0.05) recusancy (p<0.05) tension (p<0.01) psychasthenia (p<0.05) By Beck Depression (p<0.05) Alarm by Shihan (p<0.01) alexithymia (p<0.01)
BANP			emotionality (p<0.01) anxiety (p<0.05) recusancy (p<0.05) tension (p<0.01) paranoia (p<0.01) psychasthenia (p<0.01) Alarm by Shihan (p<0.01) alexithymia (p<0.01)

Conclusion

The analysis of the results allowed us to conclude that, patients with different forms of the disease are characterizing by certain psychological characteristics. For example, there are such characteristics as emotional instability, high anxiety and tension. In addition, they have higher values of indicator "alexithymia" (fairly significant, p <0,01) in comparing with other patients groups. This fact indirectly confirme the existing hypothesis that alexithymia is a risk factor psychosomatic disease [4].

Thus, the results of the statistical analysis of the experimental data revealed typical psychological

characteristics of patients with psychogenic dyspnea and various forms of asthma.

References

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МОДУЛЬ МУЛЬТИПЛИНАРНОЙ РЕКОНСТРУКЦИИ ДЛЯ АНАЛИЗА СЦИНТИГРАФИЧЕСКИХ ИЗОБРАЖЕНИЙ

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Введение

В современной радиологии используются цифровые компьютерные технологии во всех развитых странах. В прошлое уходят старые «пленочные» технологии представления и хранения результатов рентгенологических обследований. Современные аппараты дают изображение в цифровом виде, что позволяет выполнять достаточно сложную компьютерную обработку. В медицине созданы единые международные стандарты обмена медицинскими данными. Интенсивно развивающимся стандартом является DICOM (Digital Imaging and Communication in Medicine), предназначенный для передачи радиологических изображений и другой медицинской информации. Файл, хранящий одно изображение в стандарте DICOM, включает в себя как изображение, так и сопутствующую информацию.

Сцинтиграфические изображения – это изображения, полученные при помощи сцинтиграфии. Сцинтиграфия – это запись с помощью специальной камеры распределения по тканям введенного в организм радиоактивного препарата.

Компьютерная томография (КТ) позволяет получить двухмерные изображения. Если сканировать анатомические структуры тонкими срезами, то традиционная КТ позволяет получить мультипланарные изображения.

Мультипланарный режим – стандартный трехмерный режим, в котором анатомические структуры представлены на трех взаимно перпендикулярных плоскостях (рис. 1). Если тело человека, находящегося в анатомической стойке, условно поместить в трёхмерную прямоугольную систему координат, ось X располагается в переднезаднем направлении, ось Y идёт слева направо или справа налево, а ось Z направляется вверх и вниз, то есть вдоль тела человека.

Сагиттальная плоскость, XZ, разделяет правую и левую половины тела. Коронарная, YZ, располагается вертикально, она отделяет переднюю часть тела от задней части. Аксиальная, XY, параллельна поверхности земли, она отделяет вышележащие отделы тела от нижележащих.

Рис. 1. Анатомические плоскости

Реализация модуля

Основной задачей восстановления является построение трехмерной модели по дискретному набору аксиальных срезов. Для решения поставленной задачи был выбран метод, основанный на утверждении, что сканирование осуществляется соприкасающимися срезами. В этом случай геометрически отдельное изображение (срез) состоит из вокселов (рис. 2).
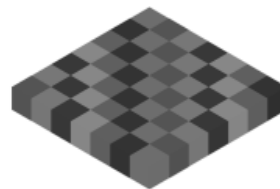

Рис. 2. Геометрическое представление среза

Технически эти изображения состоят из двухмерных числовых матриц, заполненных значениями цвета (рис. 3).