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Nonspecific Resistance and Adaptive Potential of the Organism in Schizophrenic Patients with the Development of Neuroleptic Cardiomyopathy

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Research Article

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Abstract

The study of peripheral blood parameters, which contain important information reflecting the level of neurohumoral homeostasis and immunological reactivity, is a reliable criterion of the immune status of the body and its adaptive capabilities.

The article deals with the changes in the integral leukocyte indices in patients with schizophrenia in the development of neuroleptic cardiopathy due to the side cardiotoxic effects of antipsychotic drugs.

Keywords: Schizophrenic Patients; Neuroleptic Cardiopathy; Integral Leukocyte Indices

Introduction

Many diseases and pathological conditions are accompanied by endogenous intoxication, the degree of manifestation of which is an indirect criterion of the severity of the general condition of patients [1].

Mental illnesses, especially those related to endogenous psychoses, are no exception. In the pathogenesis of many of them, an important role is played by immune disorders, as well as changes in the reactivity and adaptive potential of the organism (APO), reflecting the level of its nonspecific resistance (NRO) [2-4]. In addition, the side effects of the used for treatment neuroleptic drugs, in particular cardiotoxicity, lead to serious changes in the level of adaptation of the organism of mentally ill [5].

A reliable way to assess the state of human health continues to be the study of peripheral blood, which in dynamics is a reflection of multifactorial external and internal processes affecting the body of the subject [6].

One of the indicators that characterize the severity of endogenous intoxication, the state of APO and the level of generalized inflammatory reaction are considered to be the values of the integral leukocyte indices (ILIs), in which the parameters of the leukocyte formula and erythrocyte sedimentation rate (ESR) are used [1,6-11].

ILIs also contain information about the state of neurohumoral homeostasis in the body [8,12]. They are an objective method of studying NRO, allowing to evaluate the work of effector mechanisms of the immune system, as well as the level of immunological reactivity in patients of different ages and in the defeat of various organs [11].

Since certain combinations of hemogram parameters reflect the integral characteristics of homeostatic systems

of the body, forming nonspecific adaptive reactions, diagnostic and prognostic capabilities of ILIs are becoming increasingly important [13].

The use of ILIs, some of which are changed at the earliest stages of the disease, allows you to evaluate the dynamics of the state of the various parts of the immune system, without resorting to special research methods [1,6,8,14,15].

In fact, we are talking about the possibility of a multifaceted assessment of the dynamics of homeostasis and the effectiveness of the treatment according to the general clinical blood analysis, which is performed in all medical institutions without exception [1,8]. When disorders develop at the organ-cellular and subcellular levels, the information obtained from this study is often the only criterion for diagnosis and control of the disease [6,8,10,13].

However, in psychiatric practice, the use of ILIs has not yet become widespread. Some exceptions are the neutrophils to lymphocytes ratio (ISNLR). For example, serious changes in NLR were detected in patients with various mental diseases, in particular schizophrenia [16-18], bipolar affective disorder, depression, Alzheimer's disease [19-23].

Herewith the study of ILIs in mentally ill patients receiving long-term antipsychotic therapy, a dangerous complication of which is neuroleptic cardiomyopathy (NCMP), practically not carried out. In order to fill the existing gap at least partially, the present study has been undertaken.

Material and Methods

The data of blood tests of 19 deceased patients with schizophrenia (men - 9, women - 10; mean age - 35.3±2.2 years) were retrospectively analyzed. In 11 patients (group II) there was no cardiac pathology, in 8 (group III) APT was complicated by the development of NCM verified at autopsy.

According to the formulas presented in the literature, calculated the integral leukocytic indexes (ILIs): a modified leukocyte index of intoxication (LIIm); the index shift of leukocytes (ISL); the index of resistance of the organism (IRO); the neutrophils to lymphocytes ratio (NLR); the index of the ratio of lymphocytes and erythrocyte sedimentation rate (IRLESR); lymphocytic-granulocyte index (LGI) [1,6,8-11,13-15]. As normal values ILIs (group I) data of the literature sources presented above are accepted.

The received quantitative results were statistically processed by the nonparametric Mann- Whitney's U-criterion) with significance level of distinctions 95% and more ($p \leq 0.05$).

Results

The results are presented in the table 1.

ILIs	Group			p		
	I	II	III	I-II	I-III	II-III
	Norm	NCMP-	NCMP+			
LIIm	1-1,6	3,09	2,07	<0,05	<0,05	<0,05
ISL	1,96	3,45	2,19	>0,05	>0,05	<0,05
IRO	50-100	235,89	101,27	<0,05	>0,05	<0,05
NLR	2,47	4,34	2,65	<0,05	>0,05	<0,05
IRLESR	1,87	15,08	9,99	<0,05	<0,05	<0,05
LGI	4,56	2,80	4,01	<0,05	>0,05	<0,05

Table 1: The integral leukocytic indexes in NCMP.

Discussion

Own studies of ILIs in schizophrenic patients with NCMP reveals an unexpected phenomenon-in patients without cardiac pathology values ILIs deviate from the norm in one direction or another much more often than in the presence of NCMP [8,24]. For example, in patients without NCMP they were detected in five of the six studied ILIs (83.3%), and in NCMP - only two (33.3%) [24].

Apparently, in such patients, a longer antipsychotic therapy, the result of which is the NCMP, leads to the formation of adaptive mechanisms that enhance the

body's resistance to adverse exogenous effects, what are the side effects of antipsychotic drugs, in particular their cardiotoxicity. In other words, a kind of "adaptation syndrome" is formed [8,24].

In addition, the indicators of all six studied or statistically significantly differ among themselves in patients without NCMP and in patients with such [24].

This is evidence that the development in patients with schizophrenia of NCMP, due to the side cardiotoxic effects of neuroleptics, imposes an additional imprint on the immune status and APO, leading to significant negative changes.

Conclusion

The study of peripheral blood indicators, which are a dynamic reflection of multifactorial external and internal processes affecting the body, remain a reliable criterion of human health and its adaptive capabilities.

IlIs contain information that characterizes the state of neurohumoral homeostasis and the level of immunological reactivity in patients of different ages and with different pathologies.

In their own studies successfully used a complex ILIs to determine the level of NRO and the immune status of mental patients in whom psychotropic therapy due to side effects of antipsychotics led to the development of NCMP.

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