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IMMUNOLOGICAL AND HEMOCOAGULATION CHANGES IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

ANNOTATION

Violations of the immune system and hemostatic system in chronic pneumonia determine the severity of the disease, the presence of exacerbation, and the degree of pulmonary heart failure. The purpose of the study was to establish the possible influence of immunity parameters on hemocoagulation in chronic pneumonia in children. Our correlation study of the frequency of exacerbations with some indicators of immunity and hemocoagulation revealed a direct correlation between these indicators. This determines the need to develop methods for effective treatment of chronic pneumonia in children in order to restore the immune system and hemocoagulation disorders, as well as reduce frequent exacerbations of the disease.

KEY WORDS: chronic pneumonia, children, immunity, hemostasis system, correlation.

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ИММУНОЛОГИЧЕСКИЕ И ГЕМОКОСВЕРГАЮЩИЕ ИЗМЕНЕНИЯ У БОЛЬНЫХ С ХРОНИЧЕСКОЙ ОБСТРУКТИВНОЙ БОЛЕЗНЬЮ ЛЕГКИХ

АННОТАЦИЯ

Нарушения иммунной и гемостатической систем при хронической пневмонии определяют тяжесть заболевания, наличие обострений и степень легочной сердечной недостаточности. Целью исследования было установить возможное влияние параметров иммунитета на гемокоагуляцию при хронической пневмонии у детей. Наше корреляционное исследование частоты обострений с некоторыми показателями иммунитета и гемокоагуляции выявило прямую корреляцию между этими показателями. Это обусловливает необходимость разработки методов эффективного лечения хронической пневмонии у детей с целью восстановления иммунной системы и нарушений свертываемости крови, а также снижения частоты обострений заболевания.

КЛЮЧЕВЫЕ СЛОВА: хроническая пневмония, дети, иммунитет, система гемостаза, корреляция.

INTRODUCTION

Chronic pneumonia (CP) occupies one of the central places in chronic bronchopulmonary pathology in children [1-12]. Over the past decades, researchers have been attracted to the study of correlations in various diseases [15,18,21,23]. In the literature there is data on the study of the correlation relationship in acute and chronic bronchopulmonary diseases between indicators of hemostasis, immunity, the structural and functional state of cell membranes, phospholipids, products of lipid peroxidation (LPO), antioxidant and endocrine systems [13,16,17,19,22]. The authors also proved a correlation depending on the severity and course of the disease.

In the literature, there are conflicting opinions on the study of the correlation between indicators of immunity and hemocoagulation [4,7,9,10,14,20].

In the literature, we have not found data on the study of the correlation between the parameters of hemostasis and immunity in chronic pneumonia in children, depending on the severity of the patients' condition.

PURPOSE OF THE STUDY

Establishing the possible influence of immunity parameters on hemocoagulation in chronic pneumonia in children.

During the study, we carried out a correlation analysis. In patients with chronic pneumonia during the period of exacerbation, a number of reliable correlations were established in Table 1.

Table 1. Correlation between hemocoagulation and immunity parameters

Indicators hemostasis	Immunity indicators	Correlation relationship	
		With moderate severity	With severe condition
Free heparin in blood plasma	T-lymphocytes	0,407	0,644
	T-suppressors	0,427	0,662
	Ig G	0,414	0,642
Fibrinogen	T-lymphocytes	0,386	0,618
	Ig G	0,504	0,699
	ASL	0,518	0,0,7
Prothrombin index	T-lymphocytes	0,654	0,612
	T-suppressors	0,598	0,611
	Ig G	0,214	0,324
	Ig M	0,156	0,298
	ASL	0,352	0,387
FAK	T-lymphocytes	0,716	0,712
	Ig M	0,647	0,412
	Ig G	0,64	0,542

Thus, a decrease in the level of free heparin in the blood plasma correlates positively with a decrease in the number of T-lymphocytes, T-suppressors and negatively with the amount of IgG. And an increase in plasma fibrinogen revealed a negative relationship with T-lymphocytes, a direct, moderate relationship between Ig G and ASL.

A significant decrease in the prothrombin index revealed a direct correlation between T-lymphocytes and negative T-suppressors.

A high degree of direct dependence was noted between the fibrinolytic activity of blood and T-lymphocytes, and an inverse relationship between Ig G and IgM. The high degree of correlation of humoral immunity that we have established leads to the activation of nonspecific effector mechanisms of the blood - complement, hemocoagulation systems and the kallikrein-kinin system.

From the above it follows that the system of cellular and humoral immunity is in a close functional relationship with the blood coagulation system.

In a correlation analysis of the immune system and hemocoagulation in patients with a severe condition with pulmonary heart failure, we established significantly high correlation relationships in Table 1. Considering that most patients experienced frequent exacerbations of chronic pneumonia, it was important to monitor the effect of exacerbation frequency on immunity and hemocoagulation parameters.

Table 2 shows the correlation between immunity parameters and the frequency of exacerbations.

When studying the correlation relationship, we established a direct correlation between indicators of immunity, hemocoagulation and the frequency of exacerbation of the disease (Table 2).

Table 2. Correlation between immunity parameters and frequency of exacerbations

Indicators immunity	Frequency of exacerbations per year			
	1-2 times	2-3 times	3-4 times	4-5 times
T lymphocytes	0,54	0,64	0,7	0,76
T-suppressors	0,32	0,56	0,68	0,7
Ig G	0,68	0,68	0,7	0,79
Ig M	0,24	0,311	0,38	0,43
ASL	0,45	0,58	0,72	0,76

Table 3 shows the correlation between hemocoagulation parameters and the frequency of exacerbations.

Table 3. Correlation between hemocoagulation parameters and exacerbation frequency

Indicators hemocoagulation	Frequency of exacerbation per year			
	1-2 раз	2-3раз	3-4 раз	4-5 раз
Recalcification time	0,23	0,26	0,46	0,58
Free heparin in blood plasma	0,34	0,376	0,564	0,68

Fibrinogen g/l	0,45	0,587	0,74	0,78
Prothrombin index	0,5	0,56	0,58	0,67
Blood FAK	0,28	0,314	0,489	0,66

CONCLUSIONS

Thus, a correlation study of the frequency of exacerbations with some indicators of immunity and hemocoagulation revealed a direct correlation between these indicators. Considering that frequent exacerbation of chronic pneumonia in children leads to profound disorders of the immune system, this can be considered the beginning of the manifestation of secondary immunological deficiency. In addition, with an increase in the frequency of exacerbations, the coagulating activity of the blood increases.

This determines the need to develop methods for effective treatment of chronic pneumonia in children in order to restore the immune system and hemocoagulation disorders, as well as reduce frequent exacerbations of the disease.

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