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The Effects of Respiratory Viral Infection in Combating Avicenna's Legacy

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ABSTRACT: The aim of the article is to analyze the study of the role of respiratory viral infections in acute bronchitis with a protracted and recurrent course, the peculiarities of the immunological picture in these forms of pathology, as well as ways to correct them using adaptogens (Ginseng). The article focuses on the use of medicinal plants used in medicine (adaptogens - Ginseng), indicated in the works of Avicenna. Particular attention is paid to the significant role of active and associated, as well as persistent and chronic viral infection, which largely determines the nature of the inflammatory process and confirms the similarity of these patients with respect to immunological disorders in the mechanisms of the formation of a protracted course of bronchial inflammation. Based on the analysis of the virological and immune status, as well as the involvement of adaptogens (Ginseng) in the treatment of these patients, a significant increase is established that exceeds the normal values of cellular, humoral immunity, phagocytic activity of neutrophils and monocytes in the peripheral blood. The author suggested that in case of detection of viral antigens and a decrease in the indices of immunological reactivity in acute bronchitis with a protracted and recurrent course, the conventional treatment should be supplemented with the appointment of adaptogens (Ginseng). The work is interdisciplinary in nature, written at the intersection of clinics, virology, immunology.

KEYWORD: Avicenna, acute bronchitis protracted (APB), recurrent (RB), of respiratory viral infections, the immunological picture, correction using adaptogens (Ginseng).

Introduction. Following the outbreak of COVID-19, we have seen a resurgence of interest in Ibn Sina. Avicenna's legacy is helping to fight the pandemic around the world. Indeed, in order to fight the microscopic virus, today's world has turned to the recommendations of the erudite Ibn Sina, the father of modern medicine, almost a thousand years ago. Scientists point out how the very idea of quarantine is rooted in the scientific work of Avicenna, who, in his five-volume medical encyclopedia "Canon [Al-Qanun] of Medicine," originally published in 1025, advocated the control of "the spread of disease."[1]. The use of medicinal plants in medicine has a long history. Even Abu Ali ibn Sino, in his work "Canon of Medicine", described more than 700 medicinal substances, considering their general and healing properties. About 150 plants described by him are also used in modern medicine. [7,8,9]. The same work describes the healing properties of Ginseng, which for many centuries gave a person strength, vigor, prolonged youth and life.

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Research objectives.

The main task of our study was to investigate the role of respiratory viral infections in acute bronchitis: acute bronchitis lingering (APB) and recurrent (RB), to study the features of the immunological picture in these forms of pathology, as well as to study ways of their correction using adaptogens.

Materials and methods.

The study included 29 patients. The first group consisted of 13 patients with APB and recurrent acute bronchitis (RB)-16, and 30 healthy people that made up the control group. A set of materials from patients, including nasopharyngeal mucosa biopsies (NMB), bronchial mucosa biopsies (Brbr), bronchial washings (BW) and bronchoalveolar lavage fluid (BAL) served as a substrate for investigation. These materials were studied to detect viruses and viral AG. The main material for the detection of humoral antibodies was paired sera or more of patients; the intervals between sera sampling were 2 to 3 weeks.

Viral AGs were detected by ELISA and by immunofluorescence (MIF); antiviral antibodies were detected by ELISA and common serological reactions. Specific antibodies of classes M and G were detected by ELISA.

Functional activity of T-lymphocytes was determined, their subpopulation analysis was performed. We also evaluated the uptake capacity of neutrophils and monocytes.

Statistical analysis of the obtained data was performed using arithmetic mean of the studied index and its standard error (M+ m), standard deviation (δ), confidence limits at 95; 99; 99.9% probability of positive samples. The reliability of differences was determined by Student's t-test.

Results of the study.

The results obtained testify to the significant role of immunological disorders in the mechanisms of formation of long-term (APB) and recurrent (RB) course of acute bronchitis. The high incidence of active (f=0.93 and 0.76) as well as associated viral infection (f=0.79 and 0.9) largely determines the nature of the inflammatory process and confirms the similarity of these patients with regard to the protracted course of bronchial inflammation. (Fig. 1). [2]. The pathogenic role of individual viruses, such as influenza A, RS virus, adeno- and coronavirus (f=0.84; 0.78; 0.77; 0.64), and their associations in the course of APB and RB is undeniable. (Fig.2). Comparative virological and clinic-immunological characterization of the patients allowed to reveal clinical significance of virus infection persisting at APB and RB (f=0,45; 0,55), and chronic at RB (f=0,15), being one of the important reasons of recurrent and long course of AB, as well as in formation of modified bronchial reactivity (MBR) in them.[6]. Data of immunologic investigations testify to the fact that in the early stages of bronchopulmonary pathology formation there are already observed the signs of suppression of humoral and cellular immunity, phagocytic index of neutrophils and monocytes.[2,3] After conventional treatment, there was a tendency to increase T-cell immunity, not exceeding the normal values, there was a significant decrease in neutrophil and monocyte FI in peripheral blood and IgA level.[5]. There was a significant increase in the level of IgM and circulating immune complexes (CIC). The level of Ig G remained significantly reduced. (Fig. 3). Convinced that unstable condition of APB and RB patients is largely determined by peculiarities of viral infection and immunological reactivity, we tried to enrich the conventional treatment with a complex of specific and nonspecific antiviral drugs. Thus, in addition to symptomatic and antiviral treatment, appropriate immunoactive drugs were prescribed: with a moderate decrease - adaptogens (Ginseng, Eleutherococcus).[4]. The

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use of adaptogens (Ginseng) in the treatment of these patients showed a significant increase, exceeding the normal values of T-lymphocytes. Significantly increased and phagocytic number of monocytes. There was a tendency to increase the level of neutrophil phagocytosis. (Tabl. 1).

Thus, our study revealed the predominant as well as clinical significance of persistent and chronic viral infection in the pathogenesis of APB and RB. Being one of the important causes of recurrent and prolonged course of AB, it undoubtedly plays a role in formation of altered bronchial reactivity (MBR) in them.

In case of detection of viral antigens and decrease of immunological reactivity indices, conventional treatment should be supplemented by prescription of adaptogens (Ginseng, Eleutherococcus) under control of virological (including serological) and immunological examination.

FIGURE 1. TYPES OF ACTIVE VIRAL INFECTION IN ACUTE BRONCHITIS WITH A PROTRACTED, RECURRENT COURSE AND CHRONIC BRONCHITIS .

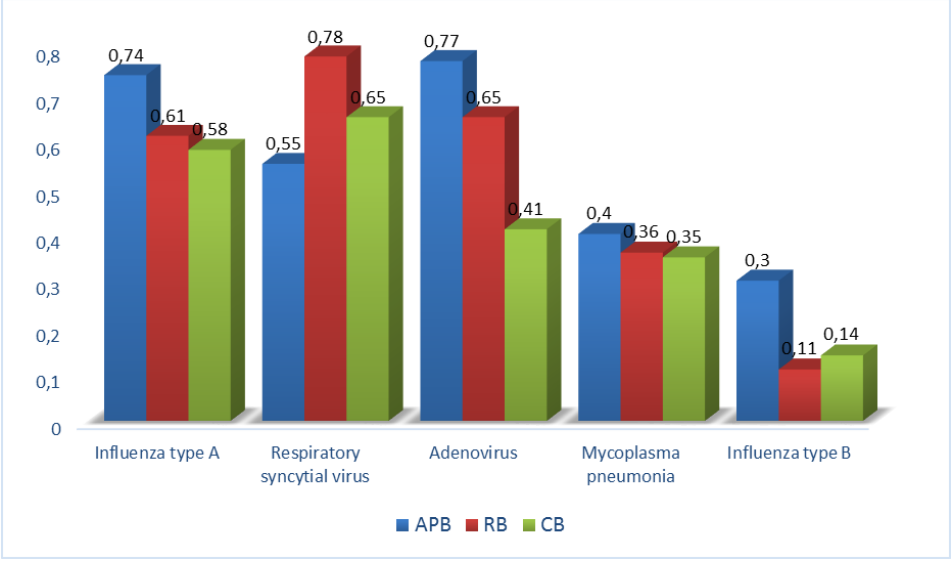

FIGURE 2. PERSISTENT AND CHRONIC VIRAL INFECTION IN ACUTE BRONCHITIS WITH A PROTRACTED AND RECURRENT COURSE.

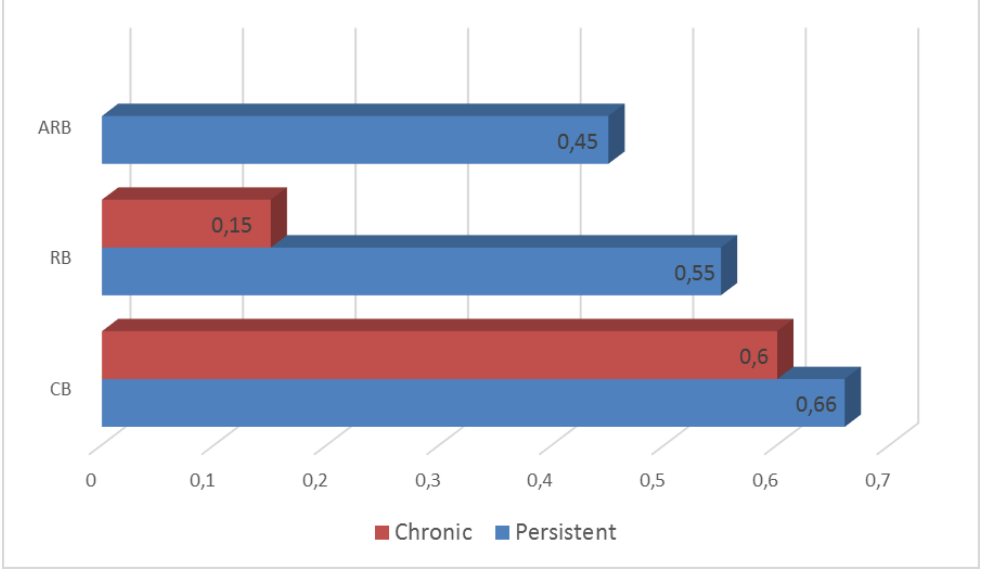

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FIG 3. IMMUNOLOGICAL PARAMETERS OF PATIENTS WITH PROTRAKTED AB WITHOUT IRS UNDER THE INFLUENCE OF CONVENTIONAL TREATMENT. (N=25)

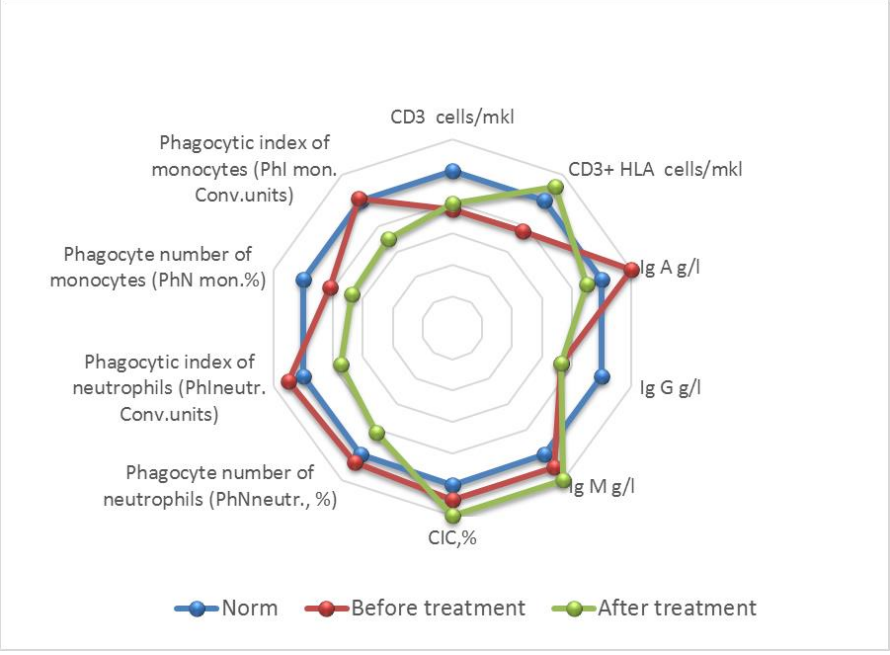

FIGURE.4. IMMUNOLOGICAL PARAMETERS OF PATIENTS WITH AB WITH PROTRAKTED AND RECURRENT COURSE WITHOUT IRS UNDER THE INFLUENCE OF COMPLEX TREATMENT WITH THE INCLUSION OF ADAPTOGENS (GINSENG). (N=29)

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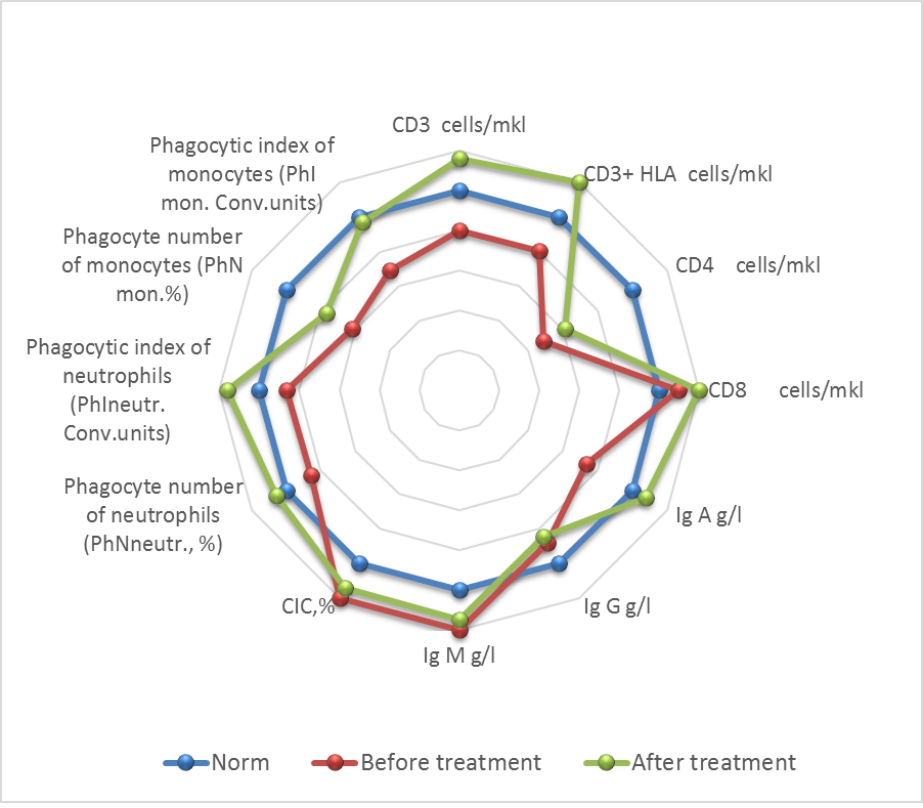

Tabl. 1. Immunological parameters of patients with AB with protrakted and recurrent course without IRS under the influence of complex treatment with the inclusion of adaptogens (Ginseng).

	CD3 cells/mkl	CD3+ HLA cells/mkl	CD4 cells/mkl	CD8 cells/mkl	Ig A g/l	Ig G g/l	Ig M g/l	CIC, %	Phagocyte number of neutrophils (PhNneutr., %)	Phagocytic index of neutrophils (PhIneutr. Conv.units)	Phagocyte number of monocytes (PhN mon.%)	Phagocytic index of monocytes (PhI mon. Conv.units)
Norm (n=30)	1079,04±84,2	678,24±38,46	802,6	292,17	2,37±0,13	16,4±0,7	1,47±0,07	87,9±4,1	71,5±2,9	6,8±0,6	66,8±4,5	5,12±0,47
Before treatment (n=29)	862,45 ±40,09	546,27 ±93,91	390,17 ±106,91	362,17 ±117,35	1,74 ± 0,17	14,46 ±1,29	2,15 ±0,26	142,83 ± 26,78	61,08 ±7,14	5,87 ±1,05	41,27 ±3,72	3,53 ± 0,57
After treatment (n=29)	1248,0 ± 87,07***	965,86 ± 95,76***	492,17 ±131,77***	427,71 ± 91,65	2,56 ± 0,22**	13,86 ± 0,61	2,05 ±0,24	125,82 ± 14,47	75,53 ±5,34	7,90 ± 1,05*	51,16 ±4,99**	4,96 ±0,86***

*P<0,05
**P<0,01
***P<0,001 Differences are significant by the end of treatment.

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