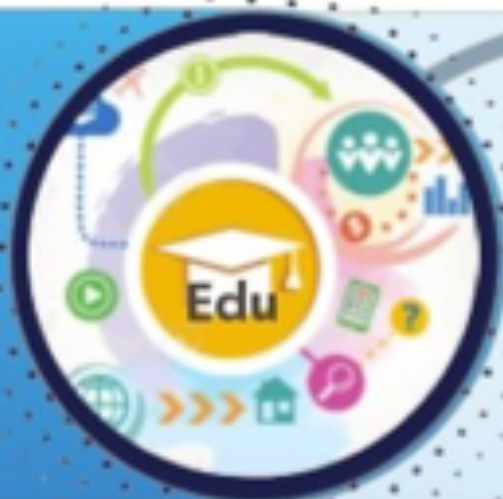


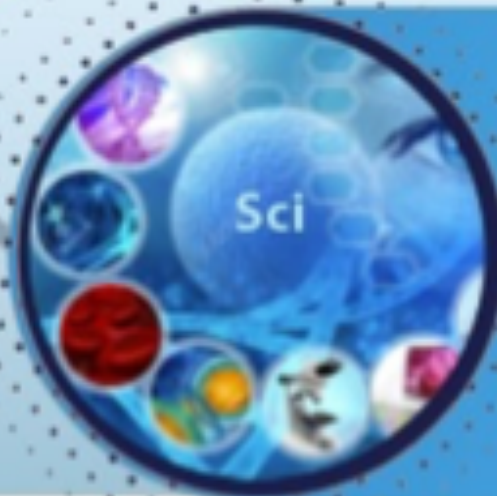


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Clinical and Immunological Status in Patients with Lung Abscesses and Search for Ways to Correct them

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ABSTRACT

Background. Most clinicians explain the increase in the number of patients with lung abscesses by environmental changes, a decrease in the standard of living, which leads to a violation of the antimicrobial resistance of the body and contributes to the development of destructive processes in the lungs.

Material and methods. The work was carried out on the basis of the multidisciplinary clinic of the Tashkent Medical Academy. A total of 131 people were examined, including 94 patients with lung abscesses and 37 donors, who made up the control group of healthy individuals.

Results. For the first time, a decrease in the number of lymphocytes carrying pan-T cell markers, but also the CD4 subpopulation, the ratio of CD4/CD8 cells and the number of cells expressing CD 16 and CD 71 receptors in the circulation of patients with acute lung abscesses was shown, which indicates a violation of cellular mechanisms of immunity. SZ and C5 in lung abscesses and growth of the baseline level of IL-6, without a significant increase in the amount of IL-8 in the blood serum. For the first time, an increase in the amount of IL-4 in lung abscesses at the systemic level was shown.

Conclusion. The pathogenetic substantiation of the expediency of using the actoprotective drug bemetyl in the complex postoperative treatment of lung abscesses contributes to the normalization of the composition of lymphocytes, the activity of the components of the classical complement activation pathway and the optimization of the excretion of circulating immune complexes.

Keywords: Lung abscesses, circulating immune complexes, immunocorrection

INTRODUCTION

The relevance of the study of the immunological aspects of the pathogenesis of lung abscesses is determined by the severity of puru-

lent-destructive lung pathology that threatens the life of patients, disrupts their health and ability to work, the importance of immunosuppression in the occurrence and development of the disease, the features of its clinical course and treatment [1, 2, 3].

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The relevance of the problem is also determined by the increase in the number of lung abscesses in recent years in Europe and America, associated with the HIV pandemic, in which there is a development of a typical acquired immunodeficiency syndrome, predisposing to the addition of various forms of opportunistic infections, including lung abscesses [4, 5, 6].

Most authors explain the increase in the number of lung abscesses in our region with disorders of antimicrobial resistance of the body and contributes to the development of destructive processes in the lungs, primarily in men of working age, engaged in low-skilled labor, alcohol abuse, suffering from chronic bronchitis, due to tobacco smoking and exposure to occupational hazards, that is, under the influence of factors that cause immunosuppression [7, 8, 9].

From the analysis of numerous literature data, the etiological role of opportunistic and opportunistic microflora in the development of lung abscesses becomes obvious, which can initiate a pathological process only in the conditions of a formed immunodeficiency state [10, 11, 12].

A purposeful long-term study of the state of immunity in patients with acute infectious lung destruction has shown that the development of abscesses occurs against the background of suppression of the humoral and phagocytic links and the general hemolytic activity of the complement system, the number and functions of T-lymphocytes.

Until now, the population and subpopulation characteristics of peripheral blood lymphocytes, the spectrum and level of cytokines produced by them, which characterize the type of immune response, have remained out of the field of view of researchers. The role of endogenous mediators of inflammation of humoral and cellular genesis, which can actively participate in the development of acute infectious lung destruction, also remains poorly studied. Research is at the initial stage aimed at finding effective drugs that optimize the function of cellular mechanisms of immunity. The effect of mercapto-benzimidazole derivatives (in particular, bemetyl) on the state of the immune system in lung abscesses has not yet been studied, although this drug has been used for more than 10 years to correct disorders in the immune system in a number of infectious and inflammatory diseases caused by opportunistic pathogenic flora [13, 14, 15].

The aim of the study was to determine the nature of the violation of the population and subpopulation spectrum of lymphocytes, the state of phlogogenic immune mechanisms of humoral (complement system) and cellu-

lar (interleukins-4,6,8) origin in patients with lung abscesses, in order to substantiate the expediency of using bemetyl in the complex postoperative therapy of this pathology.

MATERIAL AND METHODS

The work was carried out on the basis of the multidisciplinary clinic of the Tashkent Medical Academy. 131 people were examined, including 94 patients with lung abscesses and 37 donors, who made up the control group of practically healthy individuals.

Patients were admitted to the clinic on average on the 10th day of illness from hospitals in the city and region due to the severity of the disease and the lack of effect from the treatment. Upon admission to the hospital and in the dynamics of treatment, the patients underwent X-ray examination and clinical and laboratory tests according to generally accepted schemes. All patients underwent immunological examination before treatment and on days 14 to 19 from the moment of hospitalization.

Immunological examination included: analysis of the population and subpopulation composition of peripheral blood lymphocytes by indirect immunofluorescence with monoclonal antibodies; determination of the content of interleukin-4, interleukin-6 and interleukin-8 in human peripheral blood by enzyme immunoassay; determination of complement activity in blood serum; determination of the concentration of immunoglobulins A, G and M in blood serum by radial immunodiffusion.

The results of the studies were processed by standard methods of variation statistics for indicators with a normal distribution, with the calculation of the arithmetic mean and its standard error. The significance of the differences was assessed according to the Student's test (t). The differences were considered significant at $p < 0.05$. Processing of the results, the distribution of which differed from the normal one, was carried out by nonparametric methods (chi square test).

RESULTS AND DISCUSSIONS

Of the 94 patients included in the study, 83 were men and 11 were women. The age of the patients ranged from 18 to 67 years, the mean age of the patients was 46.3 ± 9.3 years. Analysis of the patients' anamnesis shows that 28 patients (29.7%) had previously suffered from pneumonia one to three times, 41 (43.6%) patients had a history of chronic bronchitis, and 6 (6.4%) patients had diabetes mellitus, which made it possible to assume with a high degree of probability

the formation of a state of immunosuppression in these patients prior to the development of an abscess. Other concomitant diseases were also noted: cardiovascular system in 26 patients (27.6%), gastrointestinal tract in 28 patients (29.7%).

Of the bad habits, the patients noted smoking - 76 people (80.7%), smoking experience from 5 to 45 years; 29 people (30.8%) abused alcohol, including 16 people (17%) who were registered with a narcologist with a diagnosis of alcoholism. Exposure to occupational hazards was noted by 31 people (32.8%). In general, 84 people (89.4%) had long-term exposure to immunosuppressive factors associated with bad habits and professional activities. The results of the analysis of the anamnesis of patients with lung abscesses coincide with the data of the literature on the regular development of purulent-destructive lung diseases mainly in persons previously exposed to immunosuppressive factors.

A mild degree of the disease, characterized by an X-ray cavity of destruction, not exceeding 3 cm in diameter, the thickness of the abscess wall of about 0.5 cm, serous discharge from the cavity, was established during hospitalization in 5 patients (5.3%). Moderate severity, which was characterized by a diameter of the destruction cavity of 3-6 cm, wall thickness not exceeding 0.7 cm, discharged from a cavity of serous-purulent character, was diagnosed in 67 patients (71.3%). A severe course of the disease was established in 22 people (23.4%).

At the time of hospitalization, patients with lung abscesses revealed leukocytosis, a shift in the blood formula "to the left" and an almost 3-fold increase in the erythrocyte sedimentation rate, which together reflects the blood picture characteristic of acute inflammation. Laboratory immunological examination was carried out in all patients upon admission to the hospital.

In lung abscesses, there is a significant, almost twofold decrease in the relative and a significant decrease in the absolute number of lymphocytes in the circulation, which may be associated with inhibition of lymphopoiesis, impaired migration, fixation and destruction of cells in the foci of local inflammation.

The decrease in the total number of lymphocytes is due to a decrease in the number of lymphocytes with T-cell markers, as well as T-helper cells, NK cells, the number of lymphocytes carrying adhesion receptors (CD11b) and markers of late activation (CD71). In general, the above changes in the total number of lymphocytes and their population spectrum reflect the formation of a deficiency of the cellular link of immunity.

An important characteristic of the functional state of the immune system is the spectrum and level of secretory

products of immune cells - cytokines, which allow us to judge the type of immune response. In patients with lung abscess, against the background of a drop in the number of CD4 lymphocytes and a decrease in the CD4/CD8 cell ratio, a significant threefold increase in the level of IL-4 compared to the donor norm, as well as a significant increase in the level of IL-6, which allows us to assume in these conditions the complete preservation of the function and even hyperfunction of T helper-2.

The preservation of the T-helper-2-dependent immune response is confirmed not only by an increase in the level of secreted cytokines typical for this subpopulation, but also by the preservation of a normal number of B-lymphocytes, as well as a fairly high level of immunoglobulin production in most patients against the background of a deficiency in the number of T-cells and their subpopulations.

Upon admission to the hospital, patients with lung abscesses have dysimmunoglobulinemia in the form of increased production of immunoglobulin A and, accordingly, a certain decrease in the level of immunoglobulins G (up to 8.2 g/l) without any significant changes in the number of immunoglobulins of the primary immune response. Taking into account the key role of IgA in the protection of mucous membranes, it is necessary to assess the switching of immunoglobulin synthesis to this class of antibodies as a compensatory reaction of the body to the course of a severe infectious destructive process in the body, which is formed at the level of the respiratory tract.

At the same time, it should be noted that the effector function of the humoral link of immunity decreases, as evidenced by a decrease in the activity of the complement system and its key components C1; G3 and C5, which may be the basis for a decrease in the cytolytic potential of the system, as well as impaired elimination of the formed circulating immune complexes. During this period of examination, patients have a significant increase in the number of circulating immune complexes, mainly fine- and medium-dispersed, which reflect the formation of immune complexes in conditions of excess antigens in the body and indicate a high probability of their long-term persistence in the bloodstream. creating conditions for the fixation of complexes on the basement membranes of vessels and tissues, the development of circulating immune complexes-dependent elements of local inflammation during the formation of immune complexes also in situ.

A significant increase in the level of IL-6 in the circulation, as well as the tendency to increase IL-8, reflects a high probability of the realization of the inflammatory

effect of these cytokines, the participation of endogenous cytokines in the development of a purulent-destructive process in the lungs.

Depending on the severity of the course of the disease, the localization and size of the abscess cavity, patients in the hospital received different treatment. Some patients (46 patients) included in Group 1 of the study received conservative treatment: antibiotic therapy (streptomycin sulfate IM 1.5-2 g/day, gentamicin IM or IV at a daily dose of 5 mg/kg) and detoxification therapy.

In 5 people (10.8%) of this group, a mild severity of the disease was established, in 41 people (89.2%) - moderate. They were dominated by right-sided, single abscesses, small cavities (no more than 2 cm in diameter), localized mainly in the root zone of the lungs. Multiple, but insignificant cavities were observed in 38.1% of patients in this group. In blood tests in patients of group 1, there was a significant decrease in the content of hemoglobin, accompanied by a tendency to a decrease in the number of red blood cells and the color index, which did not reach the degree of statistical reliability in comparison with the level of healthy people, as well as a significant increase in the total number of leukocytes, band cells, and an increase in the sedimentation rate of erythrocytes. The number of mononuclear cells (lymphocytes, monocytes) in patients treated conservatively was significantly reduced, the relative and absolute number of T-lymphocytes and C04-lymphocytes was low, the CD4/CD8 ratio was 1.3113 (versus 1.82 in the control donor group), the content of lymphocytes carrying markers of adhesion (CD11b) and activation (CD71), and the number of NK cells. Analysis of the functional activity of B-lymphocytes in this group of patients revealed signs of dysimmunoglobulinemia with an increase in the level of immunoglobulin A and a decrease in the content of Ig G. The level of circulating immune complexes was increased, with a predominance of medium-dispersed immune complexes. A decrease in the total hemolytic activity of complement, the number of effective molecules C1, SZ and C5 was established.

After conservative treatment, patients of group 1 on the 14th-19th day of hospital stay showed clinical improvement: the temperature normalized, signs of intoxication and pain decreased. The total number of leukocytes normalized. However, on the part of immune indicators, a low number of lymphocytes and T-lymphocytes remained. During this period, the patients had a normalization in the circulation of CD4 cells, the number of cells carrying the CD71 and CD11b markers, as well as a significant increase in the number of NK cells compared

to the period of hospitalization. An increase in the number of these lymphocyte populations should be evaluated as a positive sign indicating the beginning of the restoration of the process of lymphopoiesis and migration of immunocytes, since CD4 cells are the main producers of lymphocyte growth factors. An increase in the number of CD71 cells indicates a 6th increase in the number of cells with signs of positive activation. An increase in blood cells expressing adhesion receptors is a direct consequence of a decrease in the adhesion of these cells in the foci of lung tissue repair, normalization of the process of their migration.

As for the humoral indices of immunity, the level of immunoglobulin A on the 14th-19th day of treatment normalized, the amount of IgG, the level of the total activity of complement and its components remained below normal, which is the basis for the delay in the elimination and accumulation of circulating immune complexes in the bloodstream. During the entire follow-up period, the content of B-lymphocytes and the number of IgM remained normal in patients treated conservatively. So, as a result of conservative treatment, complete normalization of humoral immunity and immune status as a whole did not occur. The indicators of cellular and humoral immunity remained impaired.

Along with patients with lung abscesses treated conservatively, the study included 48 patients who received the same type of surgical treatment in the form of drainage of the abscess cavity according to Bullau under local anesthesia.

According to the nature of postoperative therapy, the patients were divided into two groups (group 2 included 25 patients, group 3 included 23 patients). Groups 2 and 3 were comparable in age, gender, nature of the clinical course, severity of the disease, and the nature of the operation. In both groups, abscesses were unilateral, with predominant lesions of the right lung and single abscesses, multiple cavities were observed in less than 1/4 of patients. The groups did not differ in the severity of clinical symptoms. In terms of severity, groups 2 and 3 were also identical, with moderate severity prevailing. In terms of the frequency of complications, the groups also did not differ significantly.

The type of changes in the hemogram and immunogram at the admission of patients to the hospital was identical.

Patients from group 2 received standard basic antibacterial and detoxification therapy in the postoperative period, and patients from group 3 received complex postoperative treatment, which included, in addition to

basic therapy, also bemityl (at a dose of 0.25 x 2 times a day for 7 days).

On the 14th-19th day from the moment of admission to the hospital (respectively, on the 7th-10th day after surgery), hemogram and immunogram parameters were determined in patients treated surgically and receiving standard postoperative therapy. Despite the basic treatment in the postoperative period, the patients still had significant differences with the hemogram of the healthy group: the number of segmented leukocytes decreased, the number of banded leukocytes and monocytes increased, and the erythrocyte sedimentation rate remained high. From the indicators of the immune status, the number of lymphocytes, T-lymphocytes, T-helper and T-cytotoxic, immunoregulatory index, the number of B-lymphocytes and CD11b cells were reduced. A number of immunological indicators after treatment turned out to be higher than those of donors. These are the relative number of CD38 cells and the total number of cells carrying the CD25 marker (IL-2 receptor). After standard treatment, the following indicators of humoral immunity normalized: IgA and Ig G, CH 50 and the activity of its components SZ and C5. However, at the same time, the number of B lymphocytes and, accordingly, the level of immunoglobulins of the primary immune response (IgM) decreased, a very high level of circulating immune complexes with a predominance of medium-sized immune complexes was preserved, which reflects the persistence of antigens and immune complexes in the bloodstream and logically explains the decrease in the activity of the initial complement component (C1), which initiates the processes of elimination of immune complexes [16-21].

Thus, in patients with lung abscesses treated surgically, on the 14th-19th day after hospitalization against the background of standard management of the postoperative period, signs of immunosuppression remained, as evidenced by the low absolute number of the main populations and subpopulations of lymphocytes in the bloodstream (CD3, CD4, CD8, CD22), a twofold decrease in the level of immunoglobulins of the primary immune response, the activity of the initial complement component C1, and impaired elimination of circulating immune complexes, which served as the basis for carrying out complex postoperative therapy with the inclusion of an actoprotective drug in some patients.

CONCLUSION

It was established that in 89.4% of the examined patients with lung abscesses, the development of the disease was preceded by the action of immunosuppressive factors: (tobacco smoking in 80.7% of

patients, alcohol abuse in 30%, work associated with various occupational hazards in 63.2%, a history of pneumonia suffered from 1 to 3 times in 29.7%, chronic bronchitis in 43.6%, diabetes mellitus in 6.4%).

Against the background of leukocytosis in patients with lung abscesses, a significant decrease in the total number of lymphocytes, T lymphocytes, T helper cells, CD4/CD8 ratio, as well as NK cells and the number of lymphocytes carrying CD71 was revealed, indicating the formation of a deficiency of the cellular link of immunity. A multiple increase in the level of IL-4 in the circulation in patients with lung abscess against the background of the formation of a pronounced defect in the cellular link of immunity and a decrease in the total number of CD4 cells reflects the high level of T helper 2 function in these conditions and, together with the growth of IL-6, ensures the preservation of the number of B-lymphocytes, the number of immunoglobulins of the primary immune response at the normal level, as well as an increased level of IgA with a minimal decrease in the level of IgG in the bloodstream.

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O'PKA XO'PPOZLARI BO'LGAN BEMORLARDA KLINIK VA IMMUNOLOGIK HOLATI VA ULARNI TUZATISH YO'LLARINI IZLASH

Бобоқуллова Ш.А.

Toshkent tibbiyot akademiyasi

ABSTRAKT

Umumiy ma'lumot. Aksariyat klinitsyenlar o'pka xo'ppozlari bilan og'rigan bemorlarning ko'payishini atrof-muhit o'zgarishi, turmush darajasining pasayishi bilan izohlashadi, bu organizmning mikroblarga qarshi qarshiligini buzilishiga olib keladi va o'pkada zararli jarayonlarning rivojlanishiga hissa qo'shadi.

Materiallar va usullar. Ish Toshkent tibbiyot akademiyasining ko'p tarmoqli klinikasi bazasida amalga oshirildi. Sog'lom shaxslarning nazorat guruhini tashkil etgan o'pka xo'ppozlari bo'lgan 94 bemor va 37 donorlar jami 131 kishi ko'rikdan o'tkazildi.

Natijalar. Birinchi marta o'pka xo'ppozlari bo'lgan bemorlarda qon aylanishida pan-T hujayra markerlarini olib boruvchi limfotsitlar sonining kamayishi, CD4 / CD8 hujayralarining nisbati va CD 16 va CD 71 retseptorlarini ifodalovchi hujayralar soni ko'rsatildi, bu immunitetning hujayrali mexanizmlari buzilishini ko'rsatadi. o'pka xo'ppozlarida SZ va C5 va IL-6 ning bazal darajasining o'sishida, qon zardobida IL-8 miqdori sezilarli darajada oshmasdan. Birinchi marta o'pka xo'ppozlarida IL-4 miqdori tizimli darajada oshgani ko'rsatildi.

Xulosa. O'pka xo'ppozlarini operatsiyadan keyingi murakkab davolashda bemitil aktoprotektiv preparatini qo'llashning patogenetik asoslanishi limfotsitlar tarkibi normallasishiga, klassik kompleman aktivativ yo'lining komponentlarining faolligiga va aylanib yuruvchi immun komplekslarining ekskretsiyasini optimalashtirishga yordam beradi.

Kalit so'zlar: O'pka xo'ppozlari, aylanayotgan immun komplekslari, immunorektikatsiya