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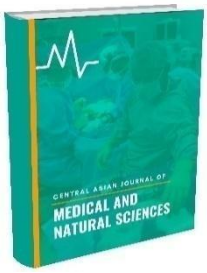

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Parallels of Disorders of Pulmonary Hemodynamics and Psycho-Emotional Imbalance in Patients with Respiratory Pathology in a Comorbid State

1. **Rakhimova D. A.**
2. **Alyavi A. L.**
3. **Tilloeva Sh. Sh**
4. **Bokeva Ch. Sh**

[1, 2] *Republican Specialized Scientifically Practical Center of Therapy and Medical Rehabilitation. Tashkent, Uzbekistan*

[3,4] *Bukhara State Medical Institute, Republic of Uzbekistan. Bukhara*

Annotation: To study interrelations psychological of factors regulations, and quality of life (QL) of the patients with remodeling right ventriculi of heart at the patients bronchial asthma complicated by cor pulmonale on a background of treatment standarttherapy, ozonotherapy (OT) and phototherapy (FT). As a result of research have established, that OT and FT on a background of bazistherapy improve patogenesis the interconnected infringements that is psychological of factors regulations, parameters QL, diastolik function right ventriculi of heard and respiratory function ($p < 0,05$).

Key words: bronchial asthma, survived covid-19 infection, pulmonary hypertension, quality of life, psychovegetative regulation factors, phototherapy.

In recent years, Uzbekistan has seen an increase in the prevalence and mortality from lung diseases complicated by chronic cor pulmonale. To optimize early diagnosis, adequate prevention and treatment of CLS, it is necessary to clarify the factors leading to its development and aggravating its course [1,7,10].

A number of authors note that with bronchial asthma (BA) PS, vasoconstriction of the vessels of the pulmonary circulation occurs, leading to hypertrophy, dilatation and insufficiency of the right ventricle (RV) of the heart.

However, the question of what pathogenetic mechanisms underlie these changes in AD PS has not yet been resolved. According to most researchers, in patients with chronic lung diseases, the leading factor in the development of hemodynamic changes and disorders of the diastolic function of the right ventricle of the heart are violations of the ventilation capacity of the lungs, hypoxia and endothelial dysfunction [3,8,9,10]. With prolonged hypoxia and an affective state in patients with BA PS, the endothelial function (EF), which promotes vascular relaxation, is significantly reduced, which can cause pulmonary vasoconstriction, the occurrence of pulmonary hypertension and right ventricular hypertrophy (RVH) of the heart.

When studying peripheral blood flow disorders in patients with chronic obstructive pulmonary disease, great importance is given to the vasoregulatory function of the vascular endothelium. The role of EF in the pathogenesis of pulmonary hypertension (PH) was studied mainly in patients with primary pulmonary hypertension. There are very few works devoted to the study of changes in the endothelial regulation of vascular tone in secondary PH in COPD patients [2]. At present, it has become obvious that neuropsychic factors have a negative impact on the state of internal organs through the autonomic nervous system [6]. Undoubtedly, prevention and therapy of patients with BA PS complicated by cor pulmonale should be early, comprehensive, rational, individual and multi-stage [4].

Significant advances in the treatment of chronic heart disease are associated with the use of calcium antagonists, which significantly improve survival and life prognosis in patients with chronic heart failure.The formation of cor pulmonale (PC) is the most severe complication of lung diseases. The quality of life (QOL) of BA patients is sharply reduced, which predetermines the unfavorable outcome of the disease. This is largely due to the fact that AD belongs to a subgroup of psychosomatic diseases, since mental and somatic factors are closely intertwined in its origin, creating complex causal relationships [1, 8, 10].Many issues of pathogenesis, diagnosis, prevention and treatment of cor pulmonale (PC) remain debatable, and the available literature data are contradictory. On the one hand, this is due to the incomplete determination of the mechanisms of LS formation, on the other hand, to objective difficulties in diagnosing it in the early stages [7, 9,12].

The reason for the increase in prevalence and mortality from BA complicated by cor pulmonale in Uzbekistan is underdiagnosis and late detection. For the earliest diagnosis, adequate prevention and treatment of patients with cor pulmonale, it is necessary to clarify the pathogenesis of this disease, the factors leading and aggravating its course [5, 6,15]. At present, it has become obvious that neuropsychic factors have a negative impact on the functional state of the bronchi through the autonomic nervous system. The vagus nerve transmits influences that cause contraction of the smooth muscles of the bronchi; through the pulmonary sympathetic plexuses - adrenergic influences that relax smooth muscles [3]. Chronic hyperactivation of the sympathoadrenal system leads to the development of a number of pathological effects, including the emergence of autonomic imbalance [4,9,13]. In this regard, a complex assessment of a wide range of parameters reflecting the structural and functional state of the cardiorespiratory system and psycho-vegetative factors of regulation of patients is of interest. These parameters determine the functional status and medical aspects of the quality of life of patients with LS [8]. Significant advances in the treatment of drugs in recent years are associated with calcium antagonists, which significantly improve survival and life prognosis in patients with cor pulmonale [3,11]. However, not all the effects of drugs in this group have been sufficiently studied. The aim of the study was to study the relationship between psychoemotional status disorders and quality of life in patients with right ventricular remodeling in patients with BA with cor pulmonale and the effectiveness of various regimens of complex therapy.

Materials and methods. 46 patients with BA complicated by LS and 30 healthy individuals (HL) were examined. In patients, according to Doppler echocardiography (Doppler echocardiography), pulmonary hypertension (PH) was assessed, without right ventricular dilatation (RVD) - (the level of mean pulmonary arterial pressure (LAP) is more than 25 mmHg) and with RVH (the thickness of the anterior wall of the RV is less than 5 mm, with an anterior-posterior size of the pancreas more than 2.5 cm).

The 1st group included 23 patients with PH, the 2nd group included 18 patients with RVD. Depending on the methods of treatment, patients are divided into the following 2 subgroups:

1a subgroup (12 patients) and 2a subgroup (9 patients) received amlodipine tablets 5-10 mg once a day, ozone therapy (OT) (OT in the form of intravenous administration of an ozone-oxygen mixture in saline, 1000 μg/l) and standard therapy (ST) according to (GINA, 2006), which includes bronchodilators of short and / or prolonged action, inhaled corticosteroids and mucolytics, as well as exercise therapy and breathing exercises, chest massage, a psychotherapy session. In the presence of signs of intrabronchial infection, patients were prescribed antibiotic therapy;

Subgroup 1b (11 patients) and subgroup 2b (9 patients) received OT procedures against the background of standard therapy.

Ozonized saline was obtained using an ozonator "Asia N" (Uzbekistan). Ozone was obtained by passing medical oxygen through the discharge chamber of the ozonator. This gas was sparged with 400.0 ml of physiological saline until an ozone concentration of 1000 μg/l was obtained.

Patients were examined on the day of admission and after 10 procedures.

The psycho-emotional status of patients was assessed on the basis of psychological testing using the method of multilateral personality research (MIL) and the Spielberger test for identifying reactive and personal anxiety. In addition, according to the table proposed by A.M. Wayne et al. (1976), studied autonomic tone.

The study of quality of life parameters in patients with BA complicated by drugs was carried out according to a specialized Seattle questionnaire and was assessed by a point system. This questionnaire makes it possible to assess the patient's level of physical condition (PS), emotional state (ES), professional suitability (PP) and satisfaction with treatment (TS).

Using Doppler echocardiography, in accordance with the recommendations of the American Society of Echocardiographers according to Hutle and Angelson (1985), the following parameters of the range of diastolic RV filling were calculated: E / A - the ratio of early and atrial filling rates; VZ (m/s) - deceleration time of early filling; VIR (m/s) – isovolumic relaxation time and atrial filling fraction (AFF, %). analyzed the level of mean pulmonary arterial pressure (LAPav, mm Hg). The ventilatory capacity of the lungs (VCL) was determined using a Medikor device (Hungary), with an assessment of forced expiratory volume in 1 second (FEV1, %), lung capacity (FVC, %), and the Tiffno index (FEV1/FVC, %).

The results were processed using the Excel software package, using Student's t-test. Differences between the studied parameters were recognized as significant at $p<0.05$.

Results and discussion. The performed studies of the emotional-personal sphere using the MIL test in patients with BA complicated by drugs showed that the leading peaks of the profile are based on scales 1-8-2. Such a change in the MIL profile indicates the presence of somatogenically conditioned anxiety, as well as personality autism with the formation of a peculiar mode of thinking and behavior.

The dominance of the anxious affect in the personality structure is confirmed by the results of psychometric analysis according to the Spielberger method using the scale of reactive anxiety (RT) and personal anxiety (LT). All patients with asthma were found to have high anxiety as a stable personality trait. According to the Spielberger scale, BA patients showed significantly higher reactive and especially personal anxiety compared to LD. The data obtained by us in a subgroup of patients with BA complicated by LS with RV showed that the level of reactive anxiety and the level of personal anxiety are higher compared with patients with BA complicated by LS with PH.

An analysis of the results showed that before treatment in patients with BA complicated by LS with PH and VRV, QoL parameters were reduced and the severity of changes in these subgroups was ambiguous. So patients with BA complicated by drugs with RVH are worse adapted to all areas of activity. The studies showed a decrease in scores on the FS and PP scale by 1.9 ± 0.08 and 3.16 ± 0.04 points, which was 2.7 and 2.2 times lower than the maximum possible score (5.2 and 7 points), and ES and UL were reduced by 2.87 ± 0.05 and 2.32 ± 0.06 points, with the maximum possible score of 5.2; 7; 7 and 5.3 points, ($p<0.05$). Patients in this subgroup experienced fear of physical activity and dissatisfaction with treatment to perform normal professional duties.

In patients with BA complicated by drugs with PH, the indices of FS, ES, PP and UL were reduced by 2.96 ± 0.09; 2.57 ± 0.05; 3.09 ± 0.05 and 2.59 ± 0.04 points ($p<0.05$). It should be noted that in patients with BA complicated by drugs with RVD, there is a tendency to a more pronounced decrease in QoL in terms of physical condition and satisfaction with treatment, in patients with BA complicated by drugs with PH

in terms of emotional state and professional fitness in life restriction ($p<0.05$). Before treatment, in parallel with the imbalance of PF regulation, there is a violation of pulmonary hemodynamics and ventilation capacity of the lungs. Thus, there was an increase in LADav, forced expiratory volume in 1 second, vital capacity and Tiffno index were reduced compared to similar indicators of PL ($p<0.005$).

As can be seen from the data presented, hypoxia plays an important role in the mechanisms of initiation of sympathicotonia, hence, an increase in LADav and remodeling of the endothelium of the cardiovascular system.

After complex therapy, using the MIL test, it was found that in patients with BA complicated by LS with PH and RVD, reactive anxiety and personal anxiety decreased in all subgroups. In subgroups 1a and 1b, the MIL test scores are higher than in subgroups 2a and 2b.

Significantly decreased reactive anxiety and especially personal anxiety in the dynamics of complex procedures in subgroups 1a and 1b ($p<0.05$). Formed mental disorders combined with anxiety-hypochondriacal shifts in the personality structure of patients with BA complicated by drugs decreased more in subgroups 1a and 1b than in subgroups 2a and 2b.

In the dynamics of treatment with ozone therapy in patients with BA complicated by LS subgroups 1a and 1b, indicators of QoL parameters: FS, ES, PP and UL improved more than in patients who received phototherapy procedures in subgroups 2a and 2b. When compared within the subgroup, in patients with BA complicated by LS with PH (subgroups 1a and 2a), the quality of life parameters turned out to be somewhat more significant than in patients with LS with RVD (subgroups 1b and 2b) ($p<0.05$).

It was found that the parameters of QoL in the dynamics of therapy in all subgroups significantly improved and increased adaptation to active physical activity. Also, an improvement in the psychological state, which is expressed in a significant decrease in depression and anxiety, improved emotional control and memory, life satisfaction, and improved social adaptation of patients.

In the dynamics of complex treatment in patients with BA complicated by LS with PH and VRV, in all subgroups, a positive shift was observed in Doppler echocardiography and ventilation capacity. We determined a decrease in VZ, VIR, FPI and LADmean, as well as an increase in E/A ($p<0.05$, the significance of the difference with the indicators before treatment). The facts obtained by us show that in the examined patients, a decrease in pressure in the pulmonary artery leads to a decrease in pressure in the pancreas of the heart. As a result, there is a decrease in the duration of VIR, VZ and FPN and a decrease in the pressure gradient between the ventricles. That is, positive changes in the pancreas significantly affect the activity of the heart and remodeling of the endothelium of the cardiovascular system.

When conducting a correlation analysis between the parameters of QOL, AFL, pulmonary hemodynamic indices and remodeling of the right ventricle of the heart, it was noted that with the improvement of bronchial patency FEV1, FS, ES, PP and UL improved by ($r=0.64$; 0.45; 0.26 and 0 .21, $p<0.03$). A decrease in the level of LADm led to an improvement in FS, ES, PP and UL by ($r=-0.74$; -0.65; -0.58 and -0.27, $p<0.01$). A relationship was established between the increase in E/A and FS, ES, PP and UL ($r=-0.57$; -0.49; -0.38 and -0.19, $p<0.05$).

The data obtained indicate that the inclusion of OT and CIS in the complex therapy of patients with asthma complicated by cor pulmonale against the background of standard therapy can increase the ventilation capacity of the lungs, reduce the hemodynamic load on the right heart, thereby improving the structure of the diastole of the right ventricle of the heart. It should be noted that the interrelated disorders of mental regulation factors and QoL of patients with right ventricular remodeling improve after the procedures, as well as the severity of the disease decreases and, in parallel, the QoL of these patients increases.

Discussion. Studies have shown that before treatment, changes in the emotional and personal sphere are parallel to violations of bronchial patency, pulmonary hemodynamics, and DFP. The progression of PH

and the development of cor pulmonale in patients with asthma are closely associated with the development of dysfunction of mental regulatory factors, which should be taken into account when developing a treatment plan for this category of patients [1, 10].

Mutual aggravation and progression of violations of DPVC and pulmonary hemodynamics is based on the commonality of some links of pathogenesis: the development of hypoxia, disorders of the pulmonary-cardiac microcirculation and pulmonary hypertension [5]. We noted a parallel improvement in the parameters of mental status, QoL and levels of VSL, LBP mean, as well as the state of LPG in patients with BA complicated by LS, which occurs after complex treatment with ozone therapy and phototherapy against the background of standard therapy.

Findings.

1. The emergence and development of complications of LS with PH and VRV in patients with BA are based on maladaptive states in the field of mental regulatory factors, which manifests itself due to a decrease in ACL and prolonged cerebral hypoxia.Patients with BA complicated by LS with dilatation of the right ventricle of the heart have a more pronounced decrease in QoL in terms of physical condition and satisfaction with treatment, in patients with BA complicated by LS with pulmonary hypertension in terms of emotional state and professional fitness ($p<0.05$), which must be taken into account when conducting rehabilitation events.

2. Treatment with amlodipine and ozone therapy against the background of standard therapy contributes to the improvement of mental disorders and QoL of patients, which positively correlates with the state of AML, LADav and RV remodeling ($p<0.05$).

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