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THE EXPRESSION OF METABOLIC CHANGES AND FACTORS OF NON-SPECIFIC RESISTANCE IN PATIENTS WITH CHRONIC BRONCHITIS AND COMORBID PEPTIC ULCER AT DIFFERENT TERMS OF TREATMENT AND OUTPATIENT OBSERVATION

SCIENTIFIC RESEARCH GROUP:

Burmak Yurii H.

Doctor of Medical Sciences, Professor,
Professor of the Department of Internal Medicine #3
Bohomolets National Medical University, Kyiv

Petrov Yevhen Ye.

Candidate of Medical Sciences, Associated Professor,
Assistant Professor of Department of Propaedeutics to Internal Medicine with
Care of Patients, General Practice (Family Medicine)
State Medical University, Poltava

Ivanytska Tetiana A.

Associate Lecturer
Department of Propaedeutics to Internal Medicine with Care of Patients,
General Practice (Family Medicine)
State Medical University, Poltava

Ivanytskyi Igor V.

Candidate of Medical Sciences, Associated Professor,
Assistant Professor of Department of Family Medicine and Therapy
State Medical University, Poltava

UKRAINE

The process of recovery after treatment of an exacerbation of chronic bronchitis (ChB) with conventional pathogenetic therapy most often proceeds for several weeks, while various residual effects in the form of post-infectious asthenia can be observed, and the presence of comorbidity can negatively affect the course of the disease and contribute to its progression [1]. During the progression of respiratory diseases, there is a violation of phagocytosis with an increase in the activity of pro-inflammatory cytokines [2], the intensity of lipid peroxidation [3, 4] with a decrease on the activity of the antioxidant system [5], and a significant role is played by a violation of the function of the endothelium [6]. The above actively affects the remodeling of the bronchial tract and the development of bronchial obstruction, damage to vessels of various calibers and changes in systemic and microhemodynamics, and in conditions of comorbidity, long-term maintenance of a local inflammatory process which implies the search for ways to correct these changes [7]. We did not exclude the possibility of changes of non-specific immune resistance, the intensity of lipid peroxidation and changes in nitric oxide metabolism in patients with ChB and comorbid peptic ulcers of the duodenum (PDU), the presence of which required timely correction.

The aim of the study was to investigate the effect of combination of sodium desoxyribonucleate and vitamin-antioxidant coplex with selenium on the phagocytic

activity of monocytes (PhAM), the intensity of lipid peroxidation (LPO) and the metabolism of nitroxide (NO) in patients with ChB (before/after exacerbation) and comorbid PDU at different terms of treatment and outpatient observation.

We examined 76 patients with ChB (exacerbation) in combination with the PDU in age from 25 to 59 years old ($37,4 \pm 1,4$ years), from them 40 persons - men (52,6%) and 36 women (47,4 %). The complex treatment of patients of the main group (45 patients), along with the conventional means, was added of sodium desoxyribonucleate of 1,5% solution in combination with the vitamin-antioxidant complex (beta-carotene 10 mg, tocopherol acetate 40 mg, ascorbic acid 100 mg) with selenium (50 mcg); 31 patients in the comparison group received conventional treatment. Three time (at the beginning of treatment, on its completion and after six month) investigated PhAM peripheral blood (assessed by phagocytic index (PI), phagocytic number (PhN), the index of attraction (IA) and the index of digestion (ID); activity of LPO (content in serum diene conjugate (DC) and malonic dialdehyde (MDA) and metabolism of nitric oxide (by the content of stable metabolites in plasma (NO_2 , NO_3) and their sum (NO_x); control group to define the norm of immunological and metabolic parameters consisted of 15 practically healthy persons. Statistical proceeding of the results was carried out using the license programs packages Microsoft Office 2003, Microsoft Excel Stadia 6.1/ prof. The significance of differences (p) for the all indices is marked in this way: * - <0.05 , ** - <0.01 , *** - <0.001 .

In patients with ChB (exacerbation) in combination with the PDU was the declined PhAM, as a reflection of violations of the macrophage phagocytic system. It was combined with a significant increase in the blood levels of the lipid peroxidation products (DC, MDA) and a decrease in the content of stable metabolites of nitric oxide. The above was based on research data, namely:

- reduce PhI more than 1.8*** times, decreased PhN more than 1.7*** times, decreased IA – more than 1.3** times; the proportion of ID in the main group and the comparison group was reduced almost twice ($P < 0.001$);

- all patients showed increase blood level of DC (2,2*** fold) and MDA (2.9*** times);

- reduction of NO_2 , NO_3 , and their total level was decreased almost 1,3** times.

We also determined that the use in complex treatment of sodium desoxyribonucleate and vitamin-antioxidant complex with selenium, compared to traditional treatment, contributes to a more significant dynamics of normalization of PhAM, LPO and metabolism of NO. This was based on the data of after treatment re-examination. It was shown that in the main group there was an increase in PhI 1.52*** times – from $16.8 \pm 0.8\%$ to $25.6 \pm 1.1\%$ (in the comparison group – 1.11; $p > 0.05$), PhN 1.46*** fold - from 2.8 ± 0.06 to 4.1 ± 0.25 (in the comparison group – 1.07; $P > 0.05$), IA 1.27** times - from $10.9 \pm 0.8\%$ to $13.8 \pm 0.6\%$ (in the comparison group – 1.06; $p > 0,05$) and ID 1.9*** times - from $12.9 \pm 0.6\%$ to $24.6 \pm 1.5\%$, reaching values of the reference standards (in the comparison group – 1.24 times ($p > 0,05$)). In the dynamics of treatment changes of LPO products: in the main group there was a decrease of the content as a DC in 2*** times (from $20.2 \pm 0.4 \mu\text{mol/l}$ to $10.4 \pm 0.5 \mu\text{mol/l}$) and MDA – 1.7*** times (from $9.7 \pm 0.3 \mu\text{mol/l}$ to $5.6 \pm 0.3 \mu\text{mol/l}$), and the content of both metabolites were significantly ($p < 0.05$) lower than that in patients of the comparison group ($15.2 \pm 0.6 \mu\text{mol/l}$ and $7.2 \pm 0.3 \mu\text{mol/l}$, respectively). Furthermore, after patients of the main group showed a significant increase in the content of stable metabolites of nitroxide, which reflected in the increase of NO_x – 1.26*** times (from $19.9 \pm 1.2 \mu\text{mol/l}$ to $25.0 \pm 1.7 \mu\text{mol/l}$), while its increase was higher than patients in the comparison group (in 1.12 times; $p > 0.05$), and the differences with the reference norm was erased.

The examination patients with ChB and comorbid PDU, conducted 6 months after the start of the observation, revealed that the direction of changes in PhAM, LPO, and metabolism nitric oxide indicators was the same and a tendency to their moderate decrease was observed, but the patients of the main group had certain differences. In contrast to patients in the comparison group, there was a tendency to increase PhI (1.14 times), ID was 1.4** times higher ($P < 0.01$), and the levels of intermediate and final products of LPO were lower by 1.28*** and 1.3*** times, respectively, which indicates the effectiveness of combined treatment with the preservation of a positive effect throughout the period of outpatient observation.

References:

- [1] Margaritopoulos, G.A., Antoniou, K.M. & Wells, A.U. (2017). Comorbidities in interstitial lung diseases. *European Respiratory Review*, 26: 160027. <https://doi.org/10.1183/16000617.0027-2016>
 - [2] Bu, T., Wang, L.F. & Yin, Y.Q. (2020). How Do Innate Immune Cells Contribute to Airway Remodeling in COPD Progression? *International Journal of Chronic Obstructive Pulmonary Disease*, 15: 107-116. <https://doi.org/10.2147/COPD.S235054>
 - [3] Marushchak, M., Maksiv, K., & Krynytska, I. (2019). The specific features of free radical oxidation in patients with chronic obstructive pulmonary disease and arterial hypertension. *Polski merkuriusz lekarski: organ Polskiego Towarzystwa Lekarskiego*, 47(279): 95–98. PMID: 31557137.
 - [4] Dudka, T., Mandryk, O., Toderica, Ya., Rachynska, I. & Marfiuk, Z. (2020). Changes in the intensity of free radical lipid oxidation in patients with bronchial asthma with concomitant chronic non-calculous cholecystitis. *Proceedings of CBU in Medicine and Pharmacy*, 1: 8-11. <https://doi.org/10.12955/pmp.v1.90>
 - [5] Shetkar, N. R. & Talikoti, P. (2019). Study of serum malondialdehyde and vitamin E in chronic bronchitis patients. *International Journal of Clinical Biochemistry and Research*, 6(2): 157-160. <http://doi.org/10.18231/j.ijcbr.2019.037>
 - [6] Ray, A., Maharana, K.Ch., Meenakshi, S. & Singh, S. (2023). Endothelial dysfunction and its relation in different disorders: Recent of update. *Health Sciences Review* 7 100084.- 11. <https://doi.org/10.1016/j.hsr.2023.100084>
 - [7] Bezerra, F.S., Lanzetti, M., Nesi, R.T., Nagato, A.C., Silva, C.Pe., Kennedy-Feitosa, E., Melo, A.C., Cattani-Cavaliere, I., Porto, L.C. & Valenca, S.S. (2023). Oxidative Stress and Inflammation in Acute and Chronic Lung Injuries. *Antioxidants*, 12(3): 548. <https://doi.org/10.3390/antiox12030548>
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