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Effect of overweight on the level of transforming growth factor in patients with purulent-destructive forms of chronic nonspecific pulmonary diseases.

M.A. Mindrul [1*]

1. The Donetsk State Medical University named after M.Gor'kiy, Ukraine

Patients with purulent-destructive forms of non-specific COPD under study have been examined on the question of the systemic level of the active form of TGF-β1. It was found that the laboratory test index of the male group of patients with such disease is currently increased in blood serum. Obese patients with purulent-destructive forms of COPD have displayed an extremely high level of the active form of TGF-β1. Clinical use of Acarbosum (Glucobay) as part of complex therapy of purulent-destructive forms of COPD in males with obesity has proved an antifibrotic effect which facilitated the reduction of an active form of TGF-β1 in blood serum.

Keyword: TGF-β1, chronic nonspecific lung diseases

1. Introduction

In the last decades, medical expectations of solving the problem of purulent-destructive forms of chronic nonspecific pulmonary diseases (COPD) (apart from antibiotic therapy and surgical treatment) have been associated with a better understanding of the main causes of the disease progression the effectiveness of anti-infective protection, chronic inflammation, pulmonary fibrosis and emphysema of lung tissue [1, 4]. In this regard, pulmonology focuses on any accompanying (background) chronic pathology of internal organs relevant to COPD, which contributes to the conditions of inflammation progression and also to the excessive amount of connective tissue. Such diseases also include obesity, the development of which forms special pathogenic conditions for the progression of chronic non-specific inflammation in bronchopulmonary system primarily due to deep disruption of the balance of cytokine potential [6]. In its turn, the development of subclinical systemic inflammatory response plays a significant role in the pathogenesis of all forms of COPD, which is an important pathogenetic mechanism of cytokine-mediated both regional (respiratory) and systemic manifestations of the disease [3, 5]. As stated above, the examination of the role of the adipokine homeostasis imbalance associated with obesity in the pathogenesis of purulent-destructive forms of COPD appears to be a very promising field of study, since it is the basis for the development of new ways of differentiated pathogenetic therapy of the indicated above comorbidity.

The main purpose of the study was a scientific rationale for the use and evaluation of the clinical efficacy of systemic therapy of obesity in the complex treatment of purulent-destructive forms of chronic nonspecific lung diseases, including preoperative preparation. The present work shows the dynamics of the cytokine level in blood plasma under the influence of systemic therapy for obesity.

2. Methods and Resources

There are 98 male patients under study suffering from destructive forms of COPD subject to surgical treatment. At admission to a surgical inpatient department all examinees displayed pulmonary exacerbation including clinical and endoscopic signs of secondary purulent bronchitis.

All examined patients were divided into the following groups: Group 1 included 36 COPD patients (19 patients with chronic lung abscess, 9 patients with bronchiectatic disease, 8 patients with cystic disease of the lungs) with body mass index (BMI) 18, 5-24, 9; Group 2-32 COPD patients (17 patients with chronic lung abscess, 9 patients bronchiectatic diseases, 6 patients with cystic disease of the lungs) and BMI ≥ 30,0.

To study the combined effect on systemic therapy for COPD complicated by obesity, the third group of patients was selected, which included 30 COPD patients (15 patients with chronic lung abscess, 8 patients with bronchiectasis, 7 patients with cystic disease of the lungs) with BMI ≥ 30, 0, in the treatment complex that includes a 12- week course of alpha-glucosidase inhibitor acarbosum (Glucobay) for 1 week-50 mg 1 time a day before meals (during dinner), starting from the 2nd week-50 mg 2 times (breakfast and dinner) and since the third week-50 mg 3 times a day before meals in case of good tolerability. When selecting the dose we take into account the fact that, according to a multicenter study APRIL, there was no significant difference in the dynamics of the studied parameters between the groups treated with acarbose indicated in a dosage of 150 mg and 300 mg [2].

The conclusive factor comprised 19 healthy male donors of corresponding age groups (healthy individuals). Serum levels of the active form of TGF-β1 were determined by immune-enzyme analysis using a test system "TGFβ1 Emax ® Immuno Assay System "(Promega, USA). The optical density of the final product of the enzyme reaction was determined photometrically.

3. Results and Discussion

The results of examining the level of the active form TGF-β1 in serum of Group1, 2 and 3 groups at admission to hospital and after undergoing the treatment are shown in Fig.

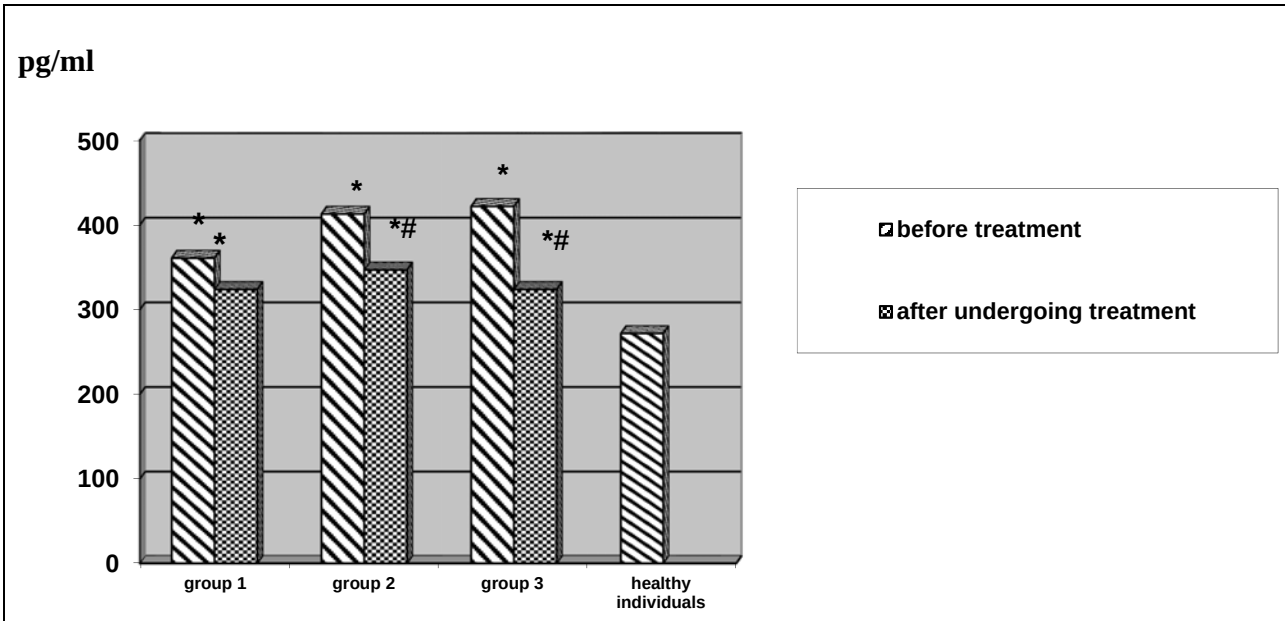
We have found out (Fig.) that at admission to hospital patients of Group 1 showed elevated levels of proinflammatory cytokine IL-8 by 81.5%, $p < 0.001$) whereas patients of groups 2 and 3 had an increase by 153.0% and 147.3% ($p < 0.001$). During the second phase of the study (after treatment) ratio analysis of Group 1, 2 and 3 did not significantly change. These facts indicate that the complex therapy of purulent-destructive forms of COPD complicated by obesity in males who were prescribed the course of acarbose (Glucobay) had no significant effect on the level of the proinflammatory cytokine IL-8.

We can prove that the increase in levels of the active form of TGF-β1 in serum of patients of group 1, 2 and 3 is also a regular laboratory feature and statistically its reliability is dependent on obesity (increase of the ratio). It was also found that under the influence of the prescribed therapy the examined index is certain to reduce in patients of Group 2 and 3 (respectively 16.1%, $p <0.01$ and 22.9%, $p <0.001$), and it also reaches the index rate of the patients belonging to Group 1.

These facts indicate that incorporation of acarbosum (Glucobay) into the complex therapy of purulent-destructive forms of COPD with obesity in males with obesity provides an antifibrotic effect (according to the level of the active form of TGF-β1 in blood serum).

4. Conclusion

Application of Acarbosum (Glucobay) as part of complex therapy of purulent-destructive forms of COPD in male individuals suffering from obesity has antifibrotic influence which facilitates the reduction of the level of the active form of TGF-β1 in blood serum.



***** - There was a significant difference ($p < 0.01$) compared with healthy individuals

\# - There was a significant difference ($p < 0.01$) compared with the first stage of the study in the same group of patients drawing Characteristics of the level of the active form of TGF-β1 in blood serum of patients of groups 1, 2 and 3 at admission and after treatment, pg/ml

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