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Experience of the use of inhaled fluticasone propionate for COPD exacerbations management in the pulmonology department

Key words: *nebulized therapy, nebuflyuzon, chronic obstructive pulmonary disease.*

In the inpatient phase of the treatment of exacerbations of chronic obstructive pulmonary disease (COPD) nebulizer therapy ranks one of the leading places. According to current (Global Initiative for Chronic Obstructive Lung Disease) recommendations, as well as national standards of medical care in pulmonology, the use of nebulizer therapy is recommended as the treatment of COPD exacerbations and for maintenance therapy. Drug administration via nebulizer is important when it is necessary to deliver high doses of inhaled corticosteroids (ICS) to the airways [3, 4]. The main purpose of nebulizer therapy is a direct administration of therapeutic dose into the bronchi of the patient in order to obtain a pharmacodynamic response in a short period of time (5 - 10 minutes) [3].

In addition, drug administration via nebulizer delivers a high concentration of active substance into the lungs, and does not require coordination with the act of inspiration, which has significant advantages over metered dose inhalers, especially in the elderly. First of all, it concerns the use of effective anti-inflammatory drugs such as inhaled corticosteroids [3, 4].

Recently, the Ukrainian pharmaceutical market has got Nebuflyuzon, a new medical product (Yuria-farm corporation), which has ICS fluticasone propionate as the active ingredient. The drug is available in suspension for inhalation in disposable containers of 2 ml; 1 ml of suspension contains 1 mg of the active ingredient. As you know, fluticasone has pronounced anti-inflammatory effect, which reduces symptoms in severe COPD patients with forced expiratory volume at 1st second (FEV_1) less than 60 % of appropriate [2, 5].

Objective: to study the efficacy of Nebuflyuzonu nebulizer therapy of COPD exacerbations in patients who were hospitalized in the pulmonology department of the Regional Hospital.

Materials and methods

The study involved 36 patients with COPD II – III severity with FEV_1 < 60 % of appropriate and non-infectious exacerbations. The criteria of exacerbation were: fatigue, cough, dyspnea, use of additional doses of short β_2-agonists during the day/week to stop the attacks, and quality of life according to the questionnaire COPD Assessment Test (CAT) [6]. Patients' respiratory function was examined before and 10 days after the treatment. Patients with COPD randomized into two comparable groups. Patients in both groups received basic treatment of exacerbation of COPD according to current guidelines (aminophylline, M-anticholinergics, β_2-agonists, expectorants) [1, 2]. Patients of the first group were given additional oral prednisolone 30 mg daily during 10 days, the second group – Nebuflyuzonu 2 ml via nebulizer (1 mg / 1 ml) 2 times a day during 10 days. «Yulayzer Pro» was used as a compression nebulizer.

Results

During exacerbations of COPD patients in both groups reported an increase of general fatigue, coughing with diffi-

cult discharge of viscous sputum, shortness of breath during low physical exertion, a feeling of tightness in the chest and need in additional doses of short-acting β_2-agonist salbutamol and/or a combination of fenoterol/ipratropium bromide. According to the questionnaire CAT (patient was offered to assess his/her condition by 8 points: cough, sputum, tightness in the chest, shortness of breath when climbing up, the activity at home, sleep quality, energy/fatigue, activity outside the home) the average scale score during exacerbation was (35,6 ± 0,4) points. During spirometry FEV_1 was (43,2 ± 1,2) % and (42,6 ± 1,2) % in the first and the second groups respectively.

After 10 days of treatment, patients in both groups noted a significant improvement: reduce of fatigue, cough and dyspnea, facilitated discharge of sputum, decreased need for additional use of short-acting β_2-agonists. However, the second group of patients, treated with inhalations via nebulizer, reported more rapid onset of therapeutic effect, and had a higher adherence to treatment, while patients of the first group were cautious with respect to corticosteroids oral intake and reported a gradual improvement (Table).

As it is showed in the Table, in the second group of patients quality of life after treatment was significantly better (16 total score indicates a moderate impact of COPD on quality of life) than in patients of the first group (22 points – pronounced impact), although the rate of FEV_1 did not differ significantly between groups. But is known that the quality of life does not always depend on the rate of FEV_1. Time of onset of clinically considerable therapeutic effect for patients was also significantly lower in patients of the second group, and length of hospital stay due to the use of nebulized Nebuflyuzon was reduced by two days.

Thus, complex application of nebulized Nebuflyuzon in the treatment of exacerbations of COPD promotes more rapid onset of clinical effect, reduces the symptoms of COPD exacerbation, shorten recovery, relieves bronchial obstruction (FEV_1 growth). A significant improvement in quality and high treatment adherence of life are also observed. Nebulized fluticasone may be an alternative to corticosteroids for oral use in the treatment of COPD exacerbation.

It is known that in COPD inhaled steroids exert another effects on effector cells than in bronchial asthma. It is known that neutrophils, unlike eosinophils, are relatively insensitive to the effects of steroids. Even high doses of inhaled corticosteroids do not reduce the number of inflammatory cells and cytokine levels [7, 8]. However, according to the literature, when taken regularly ICS reduce symptoms, improve lung function and quality of life, and significantly reduce relapse rates [8] in COPD patients with $FEV_1 < 60$ % of appropriate [2]. Nebulizers are widely used in hospitals due to the fact that there is no need in special education and medical staff monitoring. It is remarkable that patients with dyspnea when using a metered-dose inhaler are not always able to comply with the inhalation technique, namely, inhale slowly and deeply enough. However, for small doses of bronchodilator therapy (e. g. 100 – 400 mg of salbutamol) metered-dose inhalers are convenient, while nebulizer allows to use higher doses of medications [4].

In the absence of significant contraindications inhaled corticosteroids via nebulizer may be administered along with other types of therapy to all hospitalized patients with noninfectious exacerbation of COPD. Patients requiring corticosteroids should be encouraged to early initiation of treatment to get maximum results.

Conclusions

Thus, the nebulization of inhaled fluticasone propionate (Nebuflyuzon) may be considered in mamagment of noninfectious moderate to severe exacerbation of COPD in patients with $FEV_1 < 60$ % of appropriate.

Table

Parameters after treatment

Parameters	After treatment 0 to 5 points (M ± m)	
	Groop 1, n=19	Groop 2, n=17
Cough	4,3±0,3	3,4±0,4
Sputum	3,2±0,2	3,3±0,2
Tightness in the chest	2,2±0,4	1,2±0,3
Dyspnea when climbing up	3,4±0,5	2,5±0,4
Activity at home	2,3±0,1	1,3±0,2
Activity outside the home	3,4±0,3	2,3±0,2
Sleep quality	2,4±0,5	1,2±0,3
Energy/fatigue	3,5±0,2	3,4±0,4
Total score	22,3±0,6	16,2±0,3
Day of clinical effect onset (mean)	6,3±0,5	4,3±0,4
FEV_1, % of appropriate	47,5±2,1	49,3±1,5

Note: the total score indicates how COPD affects the quality of life: 0–10 – limited impact; 10–20 – moderate, 21–30 – pronounced; 31–40 – hard.

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ОПЫТ ПРИМЕНЕНИЯ ИНГАЛЯЦИЙ ФЛУТИКАЗОНА ПРОПИОНАТА ДЛЯ ЛЕЧЕНИЯ ОБОСТРЕНИЙ ХОБЛ В УСЛОВИЯХ ПУЛЬМОНОЛОГИЧЕСКОГО ОТДЕЛЕНИЯ

С. В. Коваленко

Резюме. *С целью изучения эффективности применения препарата Небуфлюзон для небулайзерной терапии неинфекционных обострений хронической обструктивной болезни легких (ХОБЛ) было проведено 10-дневное исследование, включавшее 36 больных с ХОБЛ II–III степени тяжести с $ОФВ_1$ < 60 % от должного, находящихся на стационарном лечении в пульмонологическом отделении. Небуфлюзон применялся с помощью небулайзера по 2 мл (1 мг / 1 мл) 2 раза в сутки. Активным препаратом сравнения в контрольной группе выступал преднизолон (30 мг в сутки per os). Пациенты обеих групп получали одинаковую базисную терапию согласно протоколу.*

Критериями эффективности были: уменьшение слабости, кашля, одышки, уменьшение потребности в β_2-агонистах короткого действия в течение суток/недели, прирост $ОФВ_1$, а также оценка качества жизни по опроснику COPD Assessment Test (CAT).

При оценке клинической эффективности Небуфлюзон не уступал преднизолону. Однако у больных, получавших ингаляции Небуфлюзона, отмечалось более быстрое наступление терапевтического эффекта и лучшая приверженность к лечению, что, в свою очередь, нашло отражение в сокращении срока выздоровления и пребывания в стационаре (в среднем на 2 дня), а также в значительном улучшении качества жизни больных (согласно опроснику CAT).

С учетом все более широкого применения небулайзеров в стационарах, Небуфлюзон может быть хорошей альтернативой пероральным кортикостероидам в лечении обострений ХОБЛ.

Ключевые слова: *небулайзерная терапия, небуфлюзон, хроническая обструктивная болезнь легких.*

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EXPERIENCE OF THE USE OF INHALED FLUTICASONE PROPIONATE FOR COPD EXACERBATIONS MANAGEMENT IN THE PULMONOLOGY DEPARTMENT

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Abstract. *In order to study the efficacy of fluticasone propionate (Nebuflyuzon) for inhalation therapy of noninfectious exacerbations of chronic obstructive pulmonary disease (COPD) 10-day study, involving 36 patients hospitalized in the pulmonary department with COPD stage II–III and FEV_1 < 60 %, was held. Nebuflyuzon was applied through nebulization of 2 ml (1 mg / 1 ml), 2 times a day. Active comparator in the control group was prednisolone (30 mg per day per os). Patients in both groups received the same basic therapy according to the current guidelines.*

Primary endpoints were: reduction of the total fatigue, cough, dyspnea, reduced need for short-acting β_2-agonists during the day/week, an increase of FEV_1 and the assessment of quality of life according to the COPD Assessment Test (CAT) questionnaire.

In assessing the clinical efficiency of Nebuflyuzon was similar to prednisolone. However, in patients receiving Nebuflyuzon nebulization more rapid onset of therapeutic effect and better adherence to treatment were noted, that reflected in the reduction of the period of recovery and hospital stay (on average 2 days) and significantly improved the quality of life of patients (according to the CAT).

Given the increasing use of nebulizers in hospitals, Nebuflyuzon can be a good alternative to oral corticosteroids in the treatment of COPD exacerbations.

Key words: *nebulized therapy, nebuflyuzon, chronic obstructive pulmonary disease.*

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