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Title: The mechanisms of anti-inflammatory action of bronchodilators

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Body: Tiotropium (T) is one of the basic medications in the treatment of chronic obstructive pulmonary disease (COPD). Apart from high bronchodilator activity the efficacy of T may be attributed to its potential influence on the production of active oxygen forms (AOF) by inflammatory cells. The aim was to study the effect of T on the production of AOF in the blood of patients with COPD. Methods: In in-vitro experiments the method of chemiluminescence (ChL) registration was used to study the production of AOF in the blood of patients with COPD exacerbations and the effect of T on this process. To determine a dose dependence of AOF generation in blood the concentration of T was changed. The preparation was added into the whole blood of patients in various doses (0.005 mkg/ml, 0.01 mkg/ml, 0.05 mkg/ml). Results: In comparison with normal findings ChL intensity of blood in patients with COPD exacerbations was higher by 1.4-times. At a dose of 0.005 mkg/ml T decreased ChL intensity of blood of patients by 15.1%±0.3 (p<0.05). Introduction of T at a dose of 0.01 mkg/ml reduced ChL intensity of blood of patients by 19.7%±0.6 (p<0.05). The presence of 0.05 mkg/ml of T resulted in the reduction of ChL intensity of blood of patients by 27.3%±1.5 (p<0.05). Conclusion: The study demonstrated that T possesses a dose-dependent antioxidant activity. The ability of T to suppress production of AOF underlies the mechanism of its anti-inflammatory effect in patients with COPD.