Abstract

Background: Severe bronchial asthma is a serious health problem associated with higher healthcare costs, more frequent absences from work, and a real impact on family and social life. Severe symptoms and frequent exacerbations significantly affect patients' quality of life, and the need for systemic glucocorticosteroids carries a high risk of complications. One of the treatment options for these patients is biological therapy.

Material and methods: The presented dissertation is based on two studies. The first study involved a retrospective comparative analysis of the efficacy of mepolizumab and benralizumab in real-life conditions after 6 months of therapy. The second study was a prospective assessment of changes in selected cytokine concentrations, functional and clinical parameters during biological treatment.

59 adults were included in study I: 38 of them started treatment with mepolizumab, while 21 patients started treatment with benralizumab. Patients met the eligibility criteria for biological treatment of severe asthma with benralizumab or mepolizumab in accordance with the requirements of the B.44 drug programme. An analysis was performed of spirometry results, blood count parameters, quality of life and asthma control questionnaires, OCS doses, and the number of exacerbations.

39 adults diagnosed with severe eosinophilic asthma who met the eligibility criteria for biological treatment in accordance with the requirements of the B.44 drug programme were recruited for study II. 17 patients started treatment with mepolizumab, 12 with benralizumab, and 10 with dupilumab. Changes in serum cytokine concentrations were assessed within 3–4 months (depending on the drug regimen) after the start of biological treatment. In addition, correlations between cytokine concentrations and clinical parameters were examined. Furthermore, subjective improvement in exercise capacity was analysed in patients undergoing biological treatment with the above-mentioned drugs.

Results: Biological drugs contribute to significant clinical improvement in patients, characterised by an increase in miniAQLQ questionnaire scores, a decrease in ACQ scores, and increased exercise tolerance.

Mepolizumab and benralizumab show comparable clinical efficacy in patients with severe eosinophilic asthma after 6 months of treatment. However, mepolizumab proved to be more effective in improving the FEV1/FVC parameter.

Dupilumab caused a statistically significant reduction in the concentration of the pro-inflammatory cytokine CD40L in blood serum, demonstrating an advantage in this respect over benralizumab and mepolizumab.

Conclusions: Benralizumab, dupilumab and mepolizumab are highly effective biological drugs used in the treatment of severe asthma.

Keywords: severe asthma, biological treatment, benralizumab, dupilumab, mepolizumab, cytokines