

Streszczenie w języku angielskim

Factors influencing the correctness of inhalation technique in patients with asthma or COPD.

Asthma along with chronic obstructive pulmonary disease (COPD) are among the most common lung diseases in the world. These diseases are treated with the use of inhaled medications in the form of inhalers. Despite progress in medicine, technology and better access to education or knowledge many patients with asthma and COPD still use their inhalers incorrectly, what impacts negatively therapeutic effects and impairs patients' quality of life. The aim of the doctoral thesis is to analyse the factors that may impact on proper inhalation technique in patients with asthma and COPD.

The present doctoral dissertation is based on a series of three papers: a review paper and two original papers (case-control studies). The introduction to the present doctoral dissertation is based on the review paper "*The most common mistakes made by patients in the technique of inhaling inhaled medications.*" The above-mentioned paper presents the types of available inhalers, their advantages as well as their disadvantages, and highlights the most common mistakes made by patients using inhaled medications. Finally, it also identifies the factors that should be taken into consideration when selecting the appropriate inhaler for a given patient.

Both original papers focus on the correct technique of inhaling inhaled medications by patients with asthma and COPD, and were conducted at the Department of Internal Medicine, Pulmonary Diseases and Allergy at the Medical University of Warsaw after obtaining the consent of the Ethics Committee (KB/68/2019). All patients signed the informed consent for participating in the study.

In the study "*Expectations versus reality in inhalation technique. A case-control study of inhalation technique in patients with asthma or COPD*", data that could have an impact on the inhalation technique were collected and analysed in 180 patients. The technique of inhaling was assessed using a checklist of the most common errors identified in the literature and using a 4-step questionnaire assessing the correctness of the inhalation technique. Besides, the peak inspiratory flow (PIF) was assessed in all patients.

The results of this study confirmed that most patients with asthma and COPD used inhaled medications incorrectly (112 patients (62.2%)), especially those patients using metered dose

inhalers (MDIs). The percentage of patients with correct inhalation technique was higher in the group of patients using dry powder inhalers (DPIs) 77/110 (70%).

No differences were identified between patients using inhalers correctly and incorrectly, both in MDI and DPI inhalers, in terms of age, gender, education level, motivation for treatment, occurrence of eye and hearing diseases, cognitive disorders, and advanced degenerative joint disease of hands. However, the study confirmed that insufficient education on the technique of inhaling inhaled medications was one of the main factors contributing to the low proportion of patients who used inhaled medications correctly.

The second study “*Limitation of the effectiveness of inhalation training in patients with asthma and COPD*” aimed to identify factors that impact the effectiveness of inhalation technique training and to assess the direct effectiveness of training within a group of patients with asthma and COPD. In this study, as many as 131 out of 140 patients using MDI and 79 out of 110 patients using DPI, inhaled their medications incorrectly. The training in inhalation was effective and led to correct inhalation skills in 112 out of the 131 patients using MDI (85.5%) and of 67 out of the 79 patients using DPI (84.8%); ($p=0.892$). In a univariate regression model, it was found that the improvement in the inhalation technique depended on the age and type of chronic disease in MDI users – older patients and these with COPD, achieved worse results despite thorough inhalation training. In patients using DPI, reading the drug information leaflets (80.6% vs. 50%, $p=0.022$) and a higher self-assessment of own inhalation technique (97% vs. 75%, $p=0.025$) were predictors of better response to training in the correct inhalation technique.