A physiological response to exercise leads to increased ventilation, which is an adaptive mechanism related to increased body demand for oxygen and accelerated metabolism. Maintaining constant blood gasometry parameters is the main task of the breathing control system. Increased respiratory drive and intensified activity of respiratory muscles lead to increased tidal volume. During strenuous physical exercise, when this volume reaches the level of approximately 70-75% of total lung capacity, breathing frequency is also significantly higher. In poorly trained individuals, intense breathing may be interpreted as a pathological symptom, dyspnoea, especially if it impairs normal functioning and causes respiratory discomfort and considerable fatigue. On the other hand, diseases of the respiratory system such as chronic obstructive pulmonary disease or pulmonary fibrosis are accompanied by impaired exercise tolerance, resulting in the need to reduce the intensity of effort. These are immanent features of disease progression and impaired lung function.

A specific clinical situation is the occurrence of dyspnoea and respiratory symptoms during or after strenuous physical exercise. Exercise-induced bronchoconstriction (EIB) is a term for transient constriction of the airways leading to impaired air flow and symptoms such as cough, wheezing, or dyspnoea, which appear during strenuous physical exercise or, more frequently, after its discontinuation. A delayed reaction, which occurs less often, refers to a bronchospasm that appears 3 to 8 hours after exercise. The pathogenesis of this phenomenon is not fully understood. Intense exertion and increased ventilation cause water loss and increased osmolarity of airway mucus [1]. Through the activation of mast cells, epithelial cells, eosinophils, stimulation of nervous endings, and release of numerous inflammatory mediators, histamine, prostaglandins, or leukotrienes it results in constriction of bronchial smooth muscle, mucosal oedema, and increased vascular permeability. According to another theory, called thermic or vascular, the main role is played by exposure to cool air, which contributes to vasoconstriction preventing heat loss. Discontinuation of exercise and reduction of ventilation cause vasodilation, congestion, and mucosal oedema, resulting in narrowing of the bronchi and restricted air flow. It seems that exercise-induced bronchoconstriction is a result of both mechanisms.

Exercise-induced bronchoconstriction may occur in patients with diagnosed asthma; up to 90% of patients report exercise-induced symptoms [2]. It usually indicates insufficient disease control and the necessity of treatment modification. Exercise-induced bronchoconstriction also affects 10-15% of the general population, including individuals without a history of asthma or atopy. EIB is significantly more frequent in sportsmen, especial-
The problem of exercise-induced bronchoconstriction, sometimes also called exercise induced asthma (EIA), has been known and investigated for several years. From time to time, especially in connection with international sports events, this issue is raised and becomes the subject of numerous discussions and controversies. Considerations are mainly focused on athletes with diagnosis of exercise-induced asthma, who are treated and achieve great results, confirmed by sporting awards. Many debates also concern the role of implemented treatment as a doping agent. On the other hand, epidemiological studies have demonstrated that EIB is one of the most important risk factors for sudden death in young professional sportsmen [11]. It has been pointed out that routine health assessment in sportmen should include not only the cardio-vascular system, but also the respiratory system, with special focus on diagnosing asthma and EIB. It is also very important that the teams taking care of athletes, i.e. coaches, instructors, and sports medicine doctors, should be aware of the higher risk of EIB in professional sportmen practising „asthmogenic” disciplines (especially winter sports), and its possible symptoms and diagnostic tools.

Therefore, it is very important to precisely prepare and consequently follow diagnostic criteria for EIB, and to establish indications for its pharmacotherapy. The importance of the AMP challenge test, as described in the results of Hildebrand et al. [10], might be very useful; therefore, such studies should be continued and confirmed in larger groups of subjects.
References


