Abstract

With the development of diagnostics and the whole field of somnology in the 1970s, the diagnosis of sleep apnea was defined among sleep disorders. Obstructive sleep apnea is its most common type with the highest prevalence, affecting up to 1/3 of the adult population. The disease is characterized by obstruction of the upper airways during sleep, leading to apneic pauses. The final consequence is the development of a number of comorbidities mainly of the cardiovascular system. Not yet fully clarified pathophysiological mechanisms include oxidative stress, inflammatory processes, endothelial dysfunction and others. Diagnosis is multidisciplinary, involving otorhinolaryngological examination of the upper respiratory tract and sleep monitoring, which is demanding in terms of technical equipment, time and experience. Therapy is predominantly conservative, involving lifestyle measures, weight reduction and continuous positive airway pressure therapy. Surgical therapy consists of anatomical widening or removal of the obstruction at various levels of the upper airway.

The difficulty of diagnosis has encouraged the search for alternative diagnostic methods that could be used for screening the disease or monitoring the effect of treatment. One possibility is to find a sufficiently sensitive and specific biomarker. Corresponding to the pathophysiology, biochemical biomarkers associated with oxidative stress, metabolism, inflammation, endothelial dysfunction or cardiac damage have been investigated. Newly investigated biomarkers are microRNA molecules circulating in peripheral blood, which play a key role in many biological regulatory mechanisms.

The aim of this study was to investigate the relationship of the plasma levels of selected biomarkers (C-reactive protein, pentraxin-3, high-sensitivity troponin I and microRNA-499) with obesity, gender and age in patients with obstructive sleep apnea. The monocentric retrospective analytical study included 130 patients with obstructive sleep apnea diagnosed by polysomnography or limited polygraphy, the control group consisted of 81 healthy subjects. Biomarker levels were analyzed by standard laboratory methods from samples collected from peripheral blood and then statistically evaluated. The analysis showed the relationship of high-sensitivity troponin I levels with gender, obesity level and age, and the dependence of C-reactive protein on obesity level. Pentraxin-3 and microRNA-499 were independent of all variables examined. Among the biomarkers investigated, pentraxin-3, classified as an inflammation-associated biomarker, appears to be the most promising for potential clinical use. Our demonstration of its independence of gender, age and obesity level is a significant finding for practice.