

# Abstract

**Introduction:** Obstructive sleep apnea (OSA) is characterized by repeated, complete or partial, obstructions of upper respiratory tract while asleep with accompanied apneic pauses. Interruption of ventilation and the subsequent waking reactions cause fragmented and low-quality sleep in the long term and the simultaneous decline in oxygen saturation of hemoglobin causes development of intermittent hypoxia, which leads to serious complications in patients with sleep apnea.

One of the most important etiopathogenic factors in development of obstructive sleep apnea is obesity, mainly central and android obesity. It is estimated that obese patients with  $BMI \geq 40 \text{ kg/m}^2$  suffer from OSA in over 40-60 % cases and 70 % of patients with OSA are obese. According to current findings, both the maladies influence each other and form a positive feedback loop, which further complicates the whole situation.

**Aim:** The aim of this thesis is to describe the relationship between obesity and obstructive sleep apnea on a set of patients, who were hospitalized in department D3 of III. Internal clinic of Všeobecná fakultní nemocnice v Praze (General university hospital in Prague) for suspicions for diagnosis of obstructive sleep apnea. The main tasks of the practical part of this thesis were to try to find a correlation between the degree of obesity and the severity of OSA, to compare the progress of the weight of patients, who regularly use CPAP, and patients without this therapy, and to observe a correlation of presence and severity of OSA with occurrence of type 2 diabetes mellitus and arterial hypertension.

**Methodology:** The observed set was formed of 49 probands in total, while 19 was selected for further monitoring of the weight and BMI in relation with usage of CPAP and without this therapy. Data for practical portion of this thesis was obtained from medical records kept in the hospital information system MEDEA. The obtained data included records from the year 2019, when the patients were hospitalized, up until the present. The data was subsequently evaluated using computer software Statistica 12.

**Results:** Patients who regularly use CPAP lost an average of  $28.69 \pm 28.87 \text{ kg}$  after 1 year. After 3 years from the start of the observation, body weight was on average  $6.92 \pm 17.55 \text{ kg}$  higher than after 1 year. For patients without CPAP, the initial decrease was milder (by  $19.25 \pm 41.62 \text{ kg}$ ) and the subsequent weight gain was significantly higher (by  $14.24 \pm 31.08 \text{ kg}$ ) than for patients with CPAP. Similar findings were discovered in the progress of BMI. The degree of correlation between body mass/BMI and AHI was weak or very weak in the whole set ( $r$  value ranging from 0.0384 to 0.3944 regardless of the sign). No statistically significant differences were found in AHI values after division of the set into groups according to the presence of type 2 diabetes mellitus or arterial hypertension.

**Conclusion:** The positive effect of CPAP therapy on weight loss and long-term sustainability for obese patients has been proven, and differences in weight development from long-term observation for patients with and without CPAP therapy have been found to be on the verge of significance. The expected correlation between the degree of obesity and the severity of OSA, nor the correlation between the presence and severity of OSA, with the occurrence of type 2 diabetes mellitus and arterial hypertension could not be proven.

**Keywords:** obesity, obstructive sleep apnea, CPAP, type 2 diabetes mellitus, hypertension