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Streszczenie w języku angielskim

Title: „Influence of metabolic and bariatric surgery on sleep quality and blood concentrations of biochemical and metabolic parameters reflecting glucose and lipid status in patients with obesity”

Introduction: Obesity is associated with numerous co-morbidities, including dyslipidemia, insulin resistance and type 2 diabetes mellitus. Bariatric surgery is the mainstay of treatment for obesity as the only method with confirmed long-term effects in weight reduction and remission of co-morbidities. Sleep disorders, including insomnia, deteriorated sleep quality and duration, as well as obstructive sleep apnea, are associated with obesity and reduction of body weight can be associated with a reduction of prevalence of sleep disorders. Obesity is a well-recognized risk factor for obstructive sleep apnea, but obstructive sleep apnea itself may contribute to worsening obesity. Bariatric surgery is a treatment of choice and the only causative treatment for patients with obstructive sleep apnea. Sleep disorders are bidirectionally associated with weight gain, metabolic changes and insulin resistance, leading to aggravation of the level of obesity. Bariatric surgery can interrupt this positive loop, leading to weight reduction, metabolic changes and amelioration of sleep quality. Postoperative dietary recommendations for bariatric patients, that lead to changes in eating habits, may influence the levels of laboratory parameters reflecting the metabolic and nutritional status, in addition to changes in the digestion and absorption in gastrointestinal tract after bariatric surgery.

Purpose of the study: The primary aim of the study was to assess the influence of bariatric surgery on prevalence and intensity of different sleep disturbances. The secondary aim was to analyze the relation between changes in dietary habits after bariatric surgery and the laboratory parameters reflecting the metabolic and nutritional status.

Material and method: The study included 110 patients qualified for bariatric surgery, who filled in a questionnaire with a set of structured questions about different sleep disturbances, such as difficulties in falling asleep, night awakenings, early morning awakenings, snoring and nightmares, as well as eating at night and daytime dysfunction, supplemented with Athens Insomnia Scale and dietary survey, before and 6 months after bariatric surgery. Additionally, there was data gathered on selected laboratory parameters reflecting metabolic and nutritional status, i.e. fasting glucose levels, glycated hemoglobin, cholesterol, low and high density lipoproteins, triglycerides, alanine and aspartate aminotransferases and protein.

Results: There was a statistically significant reduction of incidence of night awakenings, with 40.00% of participants reporting night awakenings before surgery and respectively 25.00% after surgery ($p<0.05$). A significant reduction was also observed in the rate of patients who reported snoring, with 60,00% before the surgery and 38.75% after the surgery ($p<0.05$). There was a correlation present between estimated weight loss % and reduction of snoring ($p<0.05$). The mean total AIS score before surgery was 7.16 and 6.00 after surgery, the change was statistically significant ($p<0.05$). The total AIS score of 8 or more, a cutoff score for insomnia diagnosis according to the Polish validation of Athens Insomnia Scale was present in 44.16% of cases before surgery and in 38.00% after surgery ($p=0.52$), with a visible lowering trend. There was a significant difference in the incidence of awakening during the night score before and after surgery ($p<0.05$; CI 0.022-0.341), sleep quality ($p<0.05$; CI 0.0105-0.4311), well-being during the day ($p<0.05$; CI 0.0273-0.4143) and sleepiness during the day ($p<0.05$; CI 0.101-0.444).

Postoperative fasting glucose levels were reduced by 14%. There was an increase of 22% in concentrations of high-density lipoproteins. Triglycerides concentrations were reduced by 32%. Aminotransferase levels decreased by 43% - alanine aminotransferase and by 14% - aspartate aminotransferase ($p<0,05$). Among the changes in dietary habits, post-bariatric patients had reduced consumption of red meat and increased consumption of fish, milk and dairy products and wholegrain products.

Conclusions: Bariatric surgery is observed to have a positive effect on selected sleep disturbances and insomnia remission in patients with obesity, measured by a significant reduction in Athens Insomnia Scale scores in follow-up 6 months after surgery. Therefore, bariatric surgery can be considered an effective therapeutic tool for insomnia and selected sleep disorders in patients with obesity. Additionally, improved dietary habits of patients after bariatric surgery may lead to changes in laboratory parameters reflecting ameliorated metabolic and nutritional status of patients after bariatric surgery.