

IX. Streszczenie w języku angielskim

Central nervous system (CNS) tumors are a complex, heterogeneous group of pathological entities with a wide range of histological, anatomical, clinical and prognostic features. Among them, the leading ones in terms of incidence are malignant neoplasms - gliomas and mostly benign neoplasms - meningiomas. Risk factors for both groups of cancers are poorly understood and many studies are still underway to identify mechanisms predisposing to their development and pathogenesis. The role of overweight and obesity as potential factors significant in carcinogenesis has been widely proven. Obesity-related mechanisms that may increase the risk of developing malignant tumors include, among others, induction of metabolic and hormonal disorders, including activation of inflammation, fluctuations in the level of insulin, insulin-like growth factor and sex hormones. Leptin is an adipocytokine, a product of the *ob* obesity gene located on chromosome 7. This hormone plays the role of a key regulator of energy balance and metabolism by acting as a factor that suppresses food intake. Research conducted over the past few years suggests that dysregulation of the leptin/leptin receptor plays a role in the development of a wide variety of malignancies. The link between cancer and obesity may be partly explained by increased leptin circulation.

The aim of the study was to assess serum leptin levels in patients diagnosed with glioma and meningioma, and to evaluate the expression of the leptin receptor in the cells of these tumors. Serum leptin levels and leptin receptor expression were correlated with clinical parameters (BMI, obesity, lifestyle).

A total of 82 patients were included in the study, including 41 patients with glioma, 41 patients with meningioma, and 60 patients in the control group. Leptin concentration was assessed using the immunoenzymatic method (ELISA) in blood serum from patients diagnosed with central nervous system neoplasms: glioma and meningioma. Leptin expression in glioma and meningioma tissues was assessed by immunohistochemistry.

The results of the study showed that the concentration of leptin among patients diagnosed with glioma was higher in overweight people than in people with normal BMI, and for obese people this difference was even more pronounced. In addition, serum leptin levels in meningioma patients are significantly higher in overweight and especially obese women. The proportion of patients with higher leptin levels is higher in both groups of cancer patients diagnosed with glioma and meningioma, and leptin levels are on average 1.27 times higher in

the study group than in the control group. It was also observed that lifestyle factors such as: smoking, drinking alcohol, frequency of consumption of meat, vegetables, fruits and soy products did not affect the occurrence of leptin levels above the norm and generally higher leptin levels in patients diagnosed with glioma and meningioma. In addition, frequent consumption of food with a long shelf life and smoked products is conducive to the occurrence of higher leptin concentrations in the group of patients with meningioma. The last significant conclusion of the conducted research is the presence of high expression of the leptin receptor among people with high BMI (overweight and obese), which was found in patients with both glioma and meningioma.