Streszczenie w języku angielskim.

INTRODUCTION

Despite the invaluable impact of insulin discovery on diabetes mellitus treatment and the tremendous advancements in modern technologies undeniably improving the treatment and quality of life for diabetes patients, other factors influencing the disease's development and treatment course are still being investigated.

PURPOSE OF THE DISSERTATION

The purpose of this dissertation, based on a series of thematically consistent research papers, was to analyze the roles of leptin and chemerin in the pathogenesis of obesity and type 1 diabetes in children.

METHODS

The study included 144 children. Among children with diabetes, 40 had newly diagnosed diabetes, 40 had diabetes for more than a year, and 14 served as the control group. In the group of children with longer disease duration, 20 had good metabolic control (HbA1c levels <7%), while 20 had poor metabolic control (HbA1c levels >7%). Levels of leptin, bioleptin, and chemerin were measured using immunoenzymatic assays. In 50 obese children, the promoter methylation status of the leptin receptor gene was assessed using the COBRA method.

RESULTS

The study revealed lower leptin levels in children with diabetes compared to healthy children. Among children with newly diagnosed diabetes, leptin levels were statistically higher than in those with long-term poorly compensated diabetes but lower than in the control group. Children with well-controlled diabetes had statistically lower leptin levels than healthy children. Bioleptin levels were statistically higher in children with newly diagnosed diabetes compared to those with long-term poorly compensated diabetes but remained lower than in healthy children. In the group with newly diagnosed diabetes, bioleptin levels were significantly higher in normal-weight, overweight, and obese children than in underweight children. Among children with long-term diabetes, boys exhibited higher bioleptin levels than girls. No significant differences in chemerin levels were observed between the study groups. Additionally, no methylation was detected in the tested CpG islands of the leptin receptor promoter gene.

CONCLUSIONS

Low leptin levels but higher bioleptin levels were characteristic of patients with newly diagnosed type 1 diabetes. Leptin and bioleptin levels, but not chemerin levels, increased with BMI. Childhood obesity was not associated with increased methylation of the leptin receptor

gene. This study provides new insights into the roles of leptin, bioleptin, and chemerin in pediatric type 1 diabetes, highlighting the need for further research in this area.