

Berk K., Charytoniuk T.

**THE EFFECT OF PREPTIN ON HEPATOCYTES LIPID METABOLISM IN
NONALCOHOLIC FATTY LIVER DISEASE**

Tutor Karolina Konstantynowicz-Nowicka, PhD

Chef of the Department: Prof. Adrian Chabowski, MD, PhD

*Department of Physiology
Medical University of Białystok*

Rationale: Preptin is newly discovered hormone, co-secreted with insulin and amylin from the pancreatic β -cells. The preptin's concentration is changed in patients with type 2 diabetes mellitus. However, so far it is still unclear whether preptin has direct impact on body's tissue insulin sensitivity or this hormone may modulate glucose metabolism through changes in sphingolipid metabolism or only by amplifying insulin secretion.

Objective: The main aim of this project was to assess potentially beneficial effect of preptin on insulin sensitivity and sphingolipid metabolism in palmitate-induced insulin resistant HepG2 cells as a model of Nonalcoholic fatty liver disease (NAFLD) with coexisting insulin resistance (IR).

Materials and methods: The experiment was conducted on HepG2 cells cultured in standard growth medium (DMEM supplemented with 10% fetal bovine serum and 1% penicillin/streptomycin) for 5 days at 37 °C in 5% CO₂ atmosphere. The experimental groups were incubated with palmitic acid (0.5 mM) for 18 h to induce insulin resistance. Consequently, a part of groups were treated with preptin in three selected concentrations for 1 hour. Intracellular sphingolipid concentrations were assessed by high performance liquid chromatography (HPLC). The expression of proteins involved in glucose metabolism and insulin signaling pathway proteins were estimated by Western Blot.

Results and discussion: In our study, there was a marked decrease in concentration of the main sphingolipid fraction, namely ceramide, after preptin treatment. However only the highest concentration of preptin was effective and changed the degree of sphingolipid accumulation in HepG2 cells. Exposure to palmitate together with preptin resulted in decreased insulin resistance, but changes did not reach the level of significance.

Conclusions: According to our knowledge, this is the first project which evaluated dose-dependent alterations in sphingolipid metabolism in HepG2 cells after treatment with preptin. The results of this study may provide a basis for further, more extensive studies on primary hepatocytes and animals, which may reveal the new biological role of preptin in human organism.

Funding: The project was financed within the framework of the Polish Ministry of Science and Higher Education program "Strategy of Excellence - the University of Research" in the years 2018 - 2019 project no 0017/SDU/2018/18 the amount of funding PLN 690 000.