Abstract

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Background: We observed the effect of liraglutide (LIRA; a GLP-1 analogue) on rat non-steatotic (ST-1) and steatotic (HF) rat hepatocytes in vitro. We also monitored its potential hepatoprotective effect on the cells damaged by acetaminophen (APAP).

Methods: As a model for our experiments we used the primary cultures of rat hepatocytes isolated from the liver of male Wistar rats. For isolation of lean and fatty hepatocytes, we used rats fed by standard laboratory diet (10% energy from fat) and high fat diet (71% energy from fat) for 6 weeks. Hepatocytes were isolated by two-step collagenase perfusion. We used LIRA at concentrations of 1, 10 and 100 nmol/l on intact, ST-1 and HF hepatocytes; we also tested effect of LIRA on hepatocytes after exposure to 2.5; 3.75 and 5 mM APAP. After 24/20-hours incubation, we tested the activity of lactate dehydrogenase (LDH) in culture medium, the viability of hepatocytes, production of albumin, and level of MDA and ROS production. Morphological evaluation of cells was performed by using phase microscopy.

Results: LIRA at tested concentrations did not lead to statistically significant change of LDH activity, had no effect on viability of the cells, or production of albumin, MDA and ROS, when compared to the appropriate controls in either group of hepatocytes. Results of our measurements did not suggest that LIRA have affected to primary cultures of intact ST-1 and HF hepatocytes. Also we did not register any changes of cellular morphology or changes of biochemical parameters in hepatocytes, which were cocultivated with APAP and LIRA.

Conclusion: LIRA at tested concentration did not show any beneficial effect after 24/20-hours incubation on biochemical parameters in intact, ST-1 or HF hepatocytes. We also did not observe any protective effect on hepatocyte injury induced by APAP.