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MODULATION OF CELL DEATH PATHWAYS UNDER THE INFLUENCE OF QUERCETIN *IN VITRO* IN ILEAL ENTEROCYTES OF MICE

Quercetin (Qu) is a flavonoid that effectively prevents disease and aids recovery by reducing oxidative stress [1]. Qu is capable of modulating the activity of SIRT1 [2] and may influence the balance between cell death and survival processes. **The aim** of the study was to investigate the processes of apoptosis, necrosis and autophagy in isolated ileal enterocytes exposed to Qu *in vitro* in mice. **Methods.** Isolation of enterocytes was performed according to Kimura Y et al. [3]. Apoptotic and necrotic death was estimated using a two-colour fluorescent staining method with Hoechst 33342 and propidium iodide. Autophagic cells were assessed using Monodansylcadaverine staining. Quercetin hydrate was used at concentrations of 2 μ M, 20 μ M and 100 μ M (337951, Sigma). The results were statistically processed in the Graph Pad Prism. **Results.** It was found that Qu (2 μ M) did not induce any statistically significant changes. Qu at a concentration of 20 μ M caused an increase of 8.38% in live enterocytes, a 31.33% decrease in the number of necrotic cells and a 41.26% decrease in apoptotic cells ($p < 0.05$) compared to the control values, the changes in autophagy were not statistically significant. Qu (100 μ M) reduced the proportion of live cells by 10.71% ($p < 0.05$) and increased the proportion of necrotic cells by 2.11-fold ($p < 0.01$), apoptotic cells by 1.49-fold ($p < 0.05$), and autophagic cells by 1.35-fold ($p < 0.05$) compared to the control values. **Conclusions.** Therefore, a dose-dependent effect of Qu on the regulated cell death of ileal enterocytes has been demonstrated. A low concentration of Qu (2 μ M) had no statistically significant effect, 20 μ M exhibited cytoprotective properties and 100 μ M had a cytotoxic effect. Consequently, Qu is capable of modulating the pathways of enterocyte death in a concentration-dependent manner; for that reason it is important to select the optimal dose to achieve a cytoprotective effect.

Keywords: Quercetin, enterocytes, apoptotic and necrotic death, autophagy.

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