Exogenous nucleosides alter the intracellular nucleotide pool in hepatic cell cultures. Implications in cell proliferation and function.


Abstract

BACKGROUND & AIMS: Dietary nucleotides are reported to influence the growth and functioning of the liver. The objective of the study was to evaluate the uptake and incorporation of exogenous nucleosides by hepatic cells, and the potential implications for cell proliferation and function.

METHODS: Liver stellate cell line CFSC-2G and primary hepatocytes in single and mixed cultures were exposed to mixtures of nucleosides and the concentrations of nucleoside derivatives were determined in the cultures, by high-performance liquid chromatography. Cell proliferation (DNA synthesis, cell cycle) and function (adenylate charge, albumin content, mitochondrial succinate dehydrogenase activity) were also evaluated.

RESULTS: The exogenous nucleosides increased the intracellular concentrations of UTP, UDP-glucose, CDP-choline and NAD(+), in the single cultures of CFSC-2G and hepatocytes. Modification of the intracellular nucleotide pool paralleled changes in cell functional status, as indicated by increased adenylate charge and albumin content in hepatocyte cultures and in their co-cultures with CFSC-2G, and by increased succinate dehydrogenase activity in hepatocytes.

CONCLUSION: Exogenous nucleosides were taken up by CFSC-2G and hepatocytes, which modified the intracellular concentrations of nucleotides, improved the functional status of hepatocytes, and partially restored the impaired adenylate charge of the co-cultures.

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