

リノレン酸を負荷させたラット培養肝細胞における食品保存料の細胞傷害作用

杉原成美、下道貴美、古野浩二

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Cytotoxicity of food preservatives in cultured rat hepatocytes loaded with linolenic acid

Narumi Sugihara, Kimi Shimomichi,
and Koji Furuno

ABSTRACT We investigated the ability of eight food preservatives to induce lipid peroxidation in normal and α -linolenic acid (LNA)-loaded cultured rat hepatocytes. On the addition of sodium dehydroacetate (DHA-Na), potassium sorbate (SA-K) or thiabendazol (TBZ) to the cell culture, lipid peroxidation, assessed in terms of the production of malondialdehyde (MDA), was induced in LNA-loaded cells, but not in normal cells. At the low concentrations, induction of lipid peroxidation in LNA-loaded cells was highest with TBZ, whereas at high concentrations DHA-Na greatly induced lipid peroxidation. The occurrence of lipid peroxidation in LNA-loaded cells was accompanied by a decrease in cellular GSH levels with the three preservatives and by a decrease in cellular protein-SH levels with DHA-Na and TBZ. Furthermore, cell injury, measured by the release of LDH, was produced in LNA-loaded cells exposed to DHA-Na and SA-K. The addition of TBZ caused substantial cell injury in normal cells, and even greater injury in LNA-loaded cells. The prevention of lipid peroxidation in LNA-loaded hepatocytes by addition of an antioxidant, *N,N'*-diphenyl-*p*-phenylenediamine (DPPD) almost completely prevented DHA-Na- and SA-K-induced cell injury, and reduced TBZ-induced cell injury. The addition of diphenyl (DP), *o*-phenylphenol (OPP) or butyl *p*-hydroxybenzoate (BHB) caused severe cell injury, in association with a marked decrease in cellular levels of both of GSH and protein-SH in both groups of cells

without inducing lipid peroxidation.

抄録 培養肝細胞にリノレン酸を取り込ませて、薬物の脂質過酸化に対する感受性を増大させた脂肪肝細胞並びに正常肝細胞を用いて、8種類の食品保存料の細胞傷害作用を比較検討した。sodium dehydroacetate, thiabendazole (TBZ) 及び potassium sorbate は、脂肪肝細胞においてのみ脂質過酸化を誘起し、細胞傷害を惹起させることを明らかにした。TBZ は脂質過酸化を誘起しなかった正常肝細胞においても細胞傷害を惹起し、更に diphenyl, *o*-phenylphenol, butyl *p*-hydroxybenzoate は、脂質過酸化を誘起することなく、両細胞において細胞傷害を惹起することを報告した。