Cytoprotective effects of eupatilin, a novel antioxidative flavone, in oxidative stress-induced gastric mucosal cell damage

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Background: Alcohol, *Helicobacter pylori*, stress and NSAIDs-activated neutrophils all produce reactive oxygen species (ROS), which play an important role in gastric mucosal damage. Eupatilin is an active component of *Artemisia asiatica* possessing cytoprotective effect. The effect of eupatilin on the production of ROS and cellular damage in AGS and ECV304 cells were evaluated to prove the cytoprotective action against the above mentioned gastric mucosal cell damages. Methods: In this study cell damages were induced by the treatment of H_2O_2 *in vitro*. The changes of ROS including superoxide anion, hydroxyl radical and hydrogen peroxide was measured in the presence of eupatilin. Release of lactate dehydrogenase (LDH) was investigated for an index of cellular damage. Results: Eupatilin (150 mM) reduced LDH leakage in AGS cell, and significantly inhibited ROS production in ECV304 cells in a dose-dependent manner. A 200 mM concentration of eupatilin inhibited ROS production by 94.7%. The activity of glutathione peroxidase was significantly increased 6 times of control levels after the treatment of eupatilin (150 mM). Confocal microscopy revealed that eupatilin directly decreases ROS production in ECV304 cells that exposed to 5 mM H2DCFDA and 200 mM arachidonic acid and prevented the influx of calcium within cells, signifying the definite role of eupatilin on the cytoprotective actions in gastric mucosal cell damages. Conclusions: Eupatilin exerts cytoprotective effect through reduction of ROS generation and the activation of antioxidative system.

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DA 11004, a synthetic IDPc inhibitor, inhibits the high fat high sucrose diet-induced obesity in C57BL/6 mice.

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Recently, it has been known that NADPH-dependent isocitrate dehydrogenase (IDPc) involves in the obesity through production of NADPH, an important cofactor. DA-11004 is a synthetic potent IDPc inhibitor that IC_{50} for IDPc is 1.49μM (0.9μg/ml). The purpose of this study was to evaluate the effects of DA-11004 on the high fat high sucrose (HF)-induced obesity in C57BL/6 mice. After completing an 8-week period of experiment, mice were sacrificed at 1hr after the last DA-11004 treatment and their blood, liver, and adipose tissues (epididymal and retroperitoneal fat) were collected. There is a significant difference in the pattern of increases of body weight between HF control and DA-11004 group. In the DA-11004 (100mg/kg) treated groups, the increases of body weight and diet consumption were significantly declined and a content of epididymal fat and retroperitoneal fat was also significantly decreased as compared with HF control. DA-11004 (100mg/kg) inhibited the IDPc activity and NADPH levels in plasma, but not in liver or epididymal fat. We examined the levels of DA-11004 in plasma, liver, and epididymal fat. In plasma, levels of DA-11004 (30mg/kg) or (100mg/kg) was 0.760 ± 0.14, 3.340 ± 0.40 (μg/ml), respectively. The levels of free fatty acid (FFA) or glucose in plasma were decreased as compared with HF control.
In conclusion, DA-11004 inhibited the fatty acid synthesis in adipose tissues via IDPc inhibition