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Hepatoprotective effect of coniferic acid as a food ingredient against carbon tetrachloride-induced liver injury in mice

Dong-Ung Lee and **Suk-Chul Shin**
Dongguk University, Korea

Coniferic acid (CA) is found in the seeds of coffee, apple, peanut and orange as well as in both seeds and cell walls of commelinid plants. This phenolic compound has been reported to possess antioxidant, anticancer and anti inflammatory activities. We have investigated the hepatoprotective effect of CA against carbon tetrachloride (CCl_4)-induced acute liver injury. Mice were treated intraperitoneally with vehicle or CA (20, 40 and 80 mg/kg) 1 hour before and 2 hours after CCl_4 (20 μl/kg) injection. The serum activities of aminotransferases and the hepatic level of malondialdehyde were significantly higher after CCl_4 treatment while the concentration of reduced glutathione was lower. These changes were attenuated by CA. The serum level and mRNA expression of TNF-α significantly increased after CCl_4 treatment and CA attenuated these increases. The levels of i-NOS and COX-2 protein and mRNA expression after CCl_4 treatment were significantly higher and CA reduced these increases. CCl_4-treated mice showed increased nuclear translocation of NF-κB, and decreased levels of inhibitors of NF-κB in cytosol. Also, CCl_4 significantly increased the level of phosphorylated JNK and p38 mitogen-activated protein (MAP) kinase and nuclear translocation of activated c-Jun. CA significantly attenuated these changes. We also found that acute CCl_4 challenge induced TLR4, TLR2 and TLR9 protein and mRNA expression and CA significantly inhibited TLR4 expression. These results suggest that CA protects from CCl_4-induced acute liver injury through reduction of oxidative damage and inflammatory signaling pathways.

Biography

Dong-Ung Lee has completed his PhD from Regensburg University (Germany) and Postdoctoral studies from the same university (Institute of pharmacy). He is a Full Professor of Dongguk University (Korea) and has published more than 140 papers.

dulee@dongguk.ac.kr