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论著

# 黄皮果提取物对急性乙醇中毒致小鼠肝损伤的保护作用

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摘要 目的 探讨黄皮果提取物(EFCL)对小鼠急性乙醇中毒致肝损伤的保护作用及其可能的作用机制。方法 ICR小鼠40只, 随机分为正常对照、模型及EFCL 1.5和3.0 g·kg$^{-1}$组。EFCL 1.5和3.0 g·kg$^{-1}$组小鼠分别ig给予相应剂量的EFCL;30 min后ig给予52℃二锅头白酒12 ml·kg$^{-1}$;24 h后处死小鼠, 制备血清, 取肝组织制备10%肝组织匀浆, 采用试剂盒方法检测血清丙氨酸转氨酶(ALT)和天冬氨酸转氨酶(AST)活性, 以及肝组织匀浆中超氧化物歧化酶(SOD)活性、丙二醛(MDA)和谷胱甘肽(GSH)含量, 常规HE染色和淀粉酶-过碘酸希夫法染色观察肝组织病理形态改变, 并用免疫组织化学法测定肝组织中NF-κB和α-平滑肌肌动蛋白(α-SMA)的表达。结果 与正常对照组比较, 模型对照组小鼠血清ALT和AST活性分别升高28.0%和28.9%($P$<0.01), 肝组织匀浆中SOD活性和GSH含量分别由(706±46) kU·g$^{-1}$蛋白和(251±61)mg·g$^{-1}$蛋白降低至(515±68)kU·g$^{-1}$蛋白和(126±18)mg·g$^{-1}$蛋白, 而MDA含量由(204±21)μmol·g$^{-1}$蛋白升高至(258±50)μmol·g$^{-1}$蛋白($P$<0.05);肝组织中NF-κB和α-SMA表达增加($P$<0.01)。与模型对照组比较, EFCL 1.5和3.0 g·kg$^{-1}$组小鼠血清ALT活性分别降低了18.3%和19.8%, 血清中AST活性分别降低了6.4%和9.7%($P$<0.05, $P$<0.01);EFCL 3.0 g·kg$^{-1}$组肝组织匀浆中GSH水平和SOD活性分别升高了61.4%和14.8%($P$<0.05, $P$<0.01)。肝组织中NF-κB和α-SMA的表达水平明显低于模型对照组($P$<0.01)。肝组织病理形态检测可见, EFCL 1.5和3.0 g·kg$^{-1}$组小鼠对乙醇引起的肝细胞脂肪样变、水样变和炎症细胞浸润等均有明显改善。结论 EFCL对小鼠急性乙醇中毒所致肝损伤具有保护作用, 其机制可能与升高抗氧化酶活性、促进自由基清除、降低NF-κB的表达及抑制肝星状细胞活化有关。

关键词 黄皮果 乙醇 肝损伤 抗氧化 NF-κB α-平滑肌肌动蛋白

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# Protective effect of extract from fruit of *Clausena lansium* (Lour.) Skeels against acute alcohol-induced hepatotoxicity in mice

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**Abstract**

**OBJECTIVE** To study the protective effect of the extract from fruit of *Clausena lansium* (Lour.) Skeels (EFCL) against acute alcohol-induced hepatotoxicity in mice. **METHODS** The mouse model was established to use Red Star wine, its ethanol content was 52% by volume. Forty ICR mice were divided into four groups randomly: normal, model, EFCL 1.5 and 3.0 g·kg$^{-1}$ groups. The mice in EFCL groups were ig given EFCL 1.5 and 3.0 g·kg$^{-1}$, respectively. Thirty minutes later, wine 12 ml·kg$^{-1}$ was administered to mice except in normal group. The activity of alanine transaminase (ALT) and aspartate aminotransaminase (AST) was detected in serum,and the level of superoxide dismutase(SOD), malondialdehyde (MDA) and glutathione (GSH) was tested in the liver tissue with kits 24 h after wine administration. The pathological changes were observed after HE and amylase-periodic acid Schiff (D-PAS) staining,and the NF-κB and α-smooth muscle actin (α-SMA) expression was detected by using immunohistochemical method. **RESULTS** Compared with normal group, the activities of ALT and AST were increased by 28.0% and 28.9% ($P$<0.01) in model group; while SOD and GSH level decreased from 706±46 to (515±68)kU·g$^{-1}$ protein, and (251±61) to (126±18)mg·g$^{-1}$ protein; MDA content increased from (204±21) to (258±50)μmol·g$^{-1}$ protein ($P$<0.01); and the expression of NF-κB and α-SMA significantly increased ($P$<0.01). Compared with model group, the activity of ALT decreased by 18.3% and 19.8%, and the activity of

AST decreased by 6.4% and 9.7% in EFCL 1.5 and 3.0 g • $kg^{-1}$ groups ($P$<0.01, $P$<0.05), respectively; while the levels of SOD and GSH in EFCL 3.0 g • $kg^{-1}$ group averagely increased by 61.4% and 14.8% ($P$<0.01, $P$<0.05). Furthermore, the severe hepatic lesions as well as neutrophilic infiltration and ballooning degenerations of hepatocytes induced by ethanol were considerably reduced in EFCL 1.5 and 3.0 g • $kg^{-1}$ groups, and the expression of NF-κB and α-SMA was significantly downregulated ($P$<0.01). **CONCLUSION** EFCL has protective effect against acute alcohol-induced liver damage, which may be related with its downregurating the expression of NF-κB and inhibiting the proliferation of hepatic satellite cells.

**Key words** *Clausena lansium* (Lour.) Skeels ethanol liver injury antioxidation NF-κB α-smooth muscle actin

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