

Changes in (Na + K)-adenosine triphosphatase activity and ultrastructure of lung and kidney associated with oxidative stress induced by acute ethanol intoxication

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Study and objectives: (Na + K)-adenosine triphosphatase (ATPase) activity, oxidative stress parameters, and morphologic characteristics of the lung and kidney of rats under acute ethanol intoxication were assessed to investigate the pathogenic mechanism of tissue damage. Design and interventions: Adult rats were given ethanol (5.5 g/kg) 3 h before performing the biochemical and morphologic studies. Oxidative stress was assessed by measuring the levels of reduced glutathione (GSH) and glutathione disulfide (GSSG), the activities of key antioxidant enzymes (ie, catalase [CAT], superoxide dismutase [SOD], and glutathione peroxidase [GSH-Px]) and malondialdehyde production. (Na + K)-ATPase, a membrane-bound enzyme, also was assayed. Results: In the lung, ethanol increased MDA production by 60%, decreased GSH levels by 33%, decreased SOD and GSH-Px activity by 10%, and decreased (Na + K)-ATPase activity by 55%, whereas CAT activity was unaltered. Impaired surfactant secretion and cell adhes