Effects of ethanol on antioxidant capacity in isolated rat hepatocytes

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Abstract

AIM: To investigate dose-response and time-course of the effects of ethanol on the cell viability and antioxidant capacity in isolated rat hepatocytes.METHODS: Hepatocytes were isolated from male adult Wistar rats and seeded into 100-mm dishes. Hepatocytes were treated with ethanol at concentrations between 0 (C), 10 (E10), 50 (E50), and 100 (E100) mmol/L (dose response) for 12, 24, and 36 h (time course). Then,lactate dehydrogenase (LDH) leakage, malondialdehyde (MDA) concentration, glutathione (GSH) level, and activities of glutathione peroxidase (GPX), glutathione reductase (GRD), superoxide dismutase (SOD), and catalase (CAT) were measured.RESULTS: Our data revealed that LDH leakage was significantly increased by about 30% in group E100 over those in groups C and E10 at 24 and 36 h, The MDA concentration in groups C, E10 and E50 were significantly lower than that in group E100 at 36 h. Furthermore,the concentration of MDA in group E100 at 36 h was significantly higher by 4.5- and 1.7-fold, respectively,than that at 12 and 24 h. On the other hand, the GSH level in group E100 at 24 and 36 h was significantly decreased, by 32% and 28%, respectively, compared to that at 12 h. The activities of GRD and CAT in group E100 at 36 h were significantly less than those in groups C and E10. However, The GPX and SOD activities showed no significant change in each group.CONCLUSION: These results suggest that longtime incubation with higher concentration of ethanol (100 mmol/L) decreased the cell viability by means of reducing GRD and CAT activities and increasing lipid peroxidation.