Effects of long-term ethanol consumption on jejunal lipase and disaccharidase activities in male and female rats

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Abstract

AIM: To study the effect of long-term ethanol consumption on jejunal lipase and disaccharidase (sucrase [sucrose α-glucosidase], maltase [α-glucosidase] and lactase [β-galactosidase]) activities in rats and its gender difference. METHODS: Age-matched male and female Wistar rats were fed control or ethanol-containing liquid diets for 12 wk following the Lieber-DeCarli model. According to both the plasma aspartate aminotransferase (AST) and alanine aminotransferase (ALT) activities, 40 rats were divided into four groups as follows: male control group (MC), male ethanol group (ME), female control group (FC), and female ethanol group (FE). RESULTS: After ethanol feeding for 12 wk, the results revealed that plasma AST and ALT activities of group ME were significantly increased by 58% and 92%, respectively, than those of group MC ($P<0.05$). Similarly, plasma AST and ALT activities of group FE were also significantly increased by 61% and 188%, respectively, than those of group FC ($P<0.05$). Fat accumulation was observed in both ethanol-treated groups, while fatty changes were more severe in group FE than those in group ME. The induction of hepatic microsomal cytochrome P450 2E1 (CYP2E1) was obviously seen in group ME and group FE, but was not detected in group MC and group FC. Jejunal lipase activity of group ME was significantly increased by 1.25-fold than that of group MC ($P<0.05$). Sucrase, maltase and lactase activities of group ME were significantly decreased by 63%, 62% and 67%, respectively, compared to those of group MC ($P<0.05$). Similarly, activities of these three enzymes of group FE were also significantly decreased by 43%, 46% and 52%, respectively, compared to those of group FC ($P<0.05$). There were no significant epithelial changes in the duodenal mucosa in any group. CONCLUSION: Long-term ethanol consumption can significantly increase jejunal lipase and decrease jejunal disaccharidase activities in both male and female rats.