

New England Journal of Medicine

High blood alcohol levels in women. The role of decreased gastric alcohol dehydrogenase activity and first-pass metabolism

M Frezza, C di Padova, G Pozzato, M Terpin, E Baraona, and CS Lieber

Abstract

After consuming comparable amounts of ethanol, women have higher blood ethanol concentrations than men, even with allowance for differences in size, and are more susceptible to alcoholic liver disease. Recently, we documented significant "first-pass metabolism" of ethanol due to its oxidation by gastric tissue. We report a study of the possible contribution of this metabolism to the sex-related difference in blood alcohol concentrations in 20 men and 23 women. Six in each group were alcoholics. The first-pass metabolism was determined on the basis of the difference in areas under the curves of blood alcohol concentrations after intravenous and oral administration of ethanol (0.3 g per kilogram of body weight). Alcohol dehydrogenase activity was also measured in endoscopic gastric biopsies. In nonalcoholic subjects, the first-pass metabolism and gastric alcohol dehydrogenase activity of the women were 23 and 59 percent, respectively, of those in the men, and there was a significant correlation ($r_s = 0.659$) between first-pass metabolism and gastric mucosal alcohol dehydrogenase activity. In the alcoholic men, the first-pass metabolism and gastric alcohol dehydrogenase activity were about half those in the nonalcoholic men; in the alcoholic women, the gastric mucosal alcohol dehydrogenase activity was even lower than in the alcoholic men, and first-pass metabolism was virtually abolished. We conclude that the increased bioavailability of ethanol resulting from decreased gastric oxidation of ethanol may contribute to the enhanced vulnerability of women to acute and chronic complications of alcoholism.

ARTICLE

- ▶ [Table of Contents](#)
- ▶ [Find Similar Articles in the Journal](#)
- ▶ [Notify a friend about this article](#)

SERVICES

- ▶ [Add to Personal Archive](#)
- ▶ [Download to Citation Manager](#)
- ▶ [Alert me when this article is cited](#)

MEDLINE

- ▶ [Related Articles in Medline](#)
- [Articles in Medline by Author:](#)
 - ▶ [Frezza, M.](#)
 - ▶ [Lieber, C. S.](#)
- ▶ [Medline Citation](#)

Source Information

Institute of Medical Pathology, University School of Medicine, Trieste, Italy.