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EFFECT OF ETHANOL ON GASTROINTESTINAL
MOTILITY AND CALCIUM ABSORPTION



BY

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AND CALCIUM ABSORPTION

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ABSTRACT

The investigation of the effect of ethanol (2 g/kg BW, given as 20% solution) on the intestinal calcium absorption was investigated in female Fisher rat. Since the net intestinal absorption of any substance was a result of intestinal motility and the absorption rate, the effects of ethanol on these two components were investigated.

Both acute and chronic (4 weeks of 20% ethanol as drinking water) ethanol administration resulted in a significant delay in gastric emptying and the intestinal propulsion seemed to be slower when compared to control. However, acute intraduodenal administration of ethanol clearly showed an accelerating effect of ethanol on the intestinal motility. Thus the suppression of intestinal motility after an intragastric ethanol administration was due to both the delayed gastric emptying and a reduction in volume of content delivered to the small intestine.

Investigation of the action of ethanol on ^{45}Ca appearance in plasma after an intragastric ethanol administration showed no difference when compared to control. On the other hand, when the test solution was delivered directly into the duodenum, the early appearance of ^{45}Ca in plasma in ethanol treated animals was evident and the ^{45}Ca level reached a peak within 15 minutes. The

difference in results obtained from intragastric and intraduodenal experiment was also accounted for by the delay in gastric emptying after intragastric administration. The enhancement of ^{45}Ca flux from lumen to serosa was confirmed by the in situ intestinal loop experiment. ^{45}Ca flux was found to be greater in ileal than duodenal loop in control. The increase in ^{45}Ca flux from lumen to serosa together with the increase in luminal fluid indicated increase in epithelial permeability. However, it was not known why ethanol was more effective in stimulating the ^{45}Ca flux from lumen in the duodenum than in ileum.

In conclusion, ethanol (2 g/kg BW) given intragastrically had no effect on the calcium absorption but when given intraduodenally, it enhanced translocation of calcium from lumen to blood and increased intestinal motility. The lack of effect after intragastric administration was likely to be due to ethanol-induced delay in gastric emptying.