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Research Section

Inhibition of Gastric Mucosal Damage by Methylglyoxal Pretreatment in Rats

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Abstract—The effect of methylglyoxal pretreatment on gastric mucosal injuries caused by 80% ethanol, 25% NaCl and 0.2 M NaOH, was investigated in rats. The effects caused by pylorus ligation accumulated gastric acid secretions and ethanol-induced changes in gastric mucus secretions, levels of proteins, nucleic acid, malondialdehyde (MDA) and non-protein sulfhydryl groups were also investigated. Methylglyoxal pretreatment at oral doses of 50, 100 and 200 mg/kg body weight was found to provide a dose-dependent protection against the ulcerogenic effects of different necrotizing agents used. With the same dose regimen methylglyoxal offered significant protection against ethanol-induced damage on the parameters evaluated for histopathology. Furthermore, the pretreatment afforded a dose-dependent inhibition of pylorus ligated accumulation of gastric acid secretions and ethanol-induced depletion of stomach wall mucus, proteins, nucleic acids, NP-SH contents and an increase in the MDA levels in gastric tissue. The protective effect of methylglyoxal against ethanol-induced damage to the gastric wall mucosa may be mediated through its effect on mucus production, proteins, nucleic acids, NP-SH groups and its free-radical scavenging property under the influence of polyamines stimulated by ornithine decarboxylase activity (ODC). © 2000 Elsevier Science Ltd. All rights reserved

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Abbreviations: DTNB = 5,5'-dithiobis (2-nitrobenzoic acid); EtOH = ethanol; MDA = malondialdehyde; MG = methylglyoxal; NP-SH = non-protein sulfhydryls; ODC = ornithine decarboxylase; TCA = trichloroacetic acid.