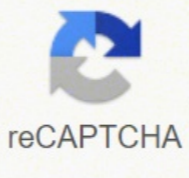




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Antilucer and antioxidant effects of Normacid syrup (a polyherbal formulation) on experimentally-induced gastric ulcers

Rajesh Maheshwari · R. Balaraman · Girish Salker · Ghanshyam Parmar · Anil Patel · A. K. Seth

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Abstract The aim of this work was to study the antioxidant and antilucer activities of Normacid syrup® (NS) in mice. Effects of NS (250 and 500 mg/kg, p.o., for 14 days) were studied on pylorus ligation and diclofenac-induced ulcers. Antilucer activity of NS was assessed from gastric secretion parameters, mucosal nitrite level and mucin content in gastric mucosa. The activity of antioxidant enzymes like super oxide dismutase (SOD), catalase (CAT), reduced glutathione (GSH) and lipid peroxidation (MDA) in the stomach tissue were quantified. Histopathological studies were done on stomach tissues. Pre-treatment with NS significantly ($p < 0.05$) reduced ulcer score and ulcer index in pylorus ligation (62.20–67.50 % protection) and diclofenac (64.19–70.85 % protection) induced gastric ulcers. NS decreased the gastric volume, free acidity and total acidity and increased the pH of gastric fluid. Simultaneously, the level mucosal nitrite and mucin content were increased significantly ($p < 0.001$). In addition, pre-treatment with NS significantly increased activities of SOD ($p < 0.001$), CAT ($p < 0.001$), GSH ($p < 0.05$ to $p < 0.001$), and reduced the MDA level ($p < 0.001$), in both models. The antilucer activity of NS is further supported by attenuation of histopathological changes caused by pylorus ligation and diclofenac. The results suggested that NS has potential antilucer activity against pylorus ligation and diclofenac-induced ulcer model. The antilucer activity might be due to its antisecretory, cytoprotective and antioxidant mechanism.

Keywords Pylorus ligation · Diclofenac · Ayurvedic formulation · Antilucer

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Introduction

Peptic ulcer disease is one of the most common gastrointestinal disorders that affect thousands of people around the world and therefore consider as global health problem (Chan and Leung 2002). Peptic ulcer occurs due to an imbalance between the aggressive (acid, pepsin and *Helicobacter pylori* infection) and the defensive (gastric mucus and bicarbonate secretion, prostaglandins, mucin resistance of the mucosal cells) factors (Papadopoulos 1999). Oxidative stress plays an important role in the pathogenesis of gastric ulcer (Das and Dasgupta 1993). Experimental studies have demonstrated that oxygen-generated free radicals and lipid peroxidation are involved in the pathogenesis of acute gastric lesions induced by ethanol, nonsteroidal anti-inflammatory drugs or due to the *Helicobacter pylori* infection (Niki et al. 2005; Hollander et al. 1983). Drugs with various mechanisms of cytoprotective action may be one way in minimizing tissue injury in human disease (Hollander 1993). Drugs currently employed in the treatment of ulcer are responsible for reducing the production of gastric acid or exert cytoprotective effects (Hoogerwerf and Parshikar 2005; Valle 2005). Due to problems associated with recurrence of ulcer and adverse effect of existing drugs, there is need for alternative medicines having antilucer properties (Rang et al. 2003). Natural remedies are commonly employed in developing countries for the treatment of various diseases and this practice being an alternative to pharmacotherapy (Dabshankar et al. 2009).

The herbal medicines derived from various plant extracts, containing wide variety of antioxidants such as phenolic and flavonoid compounds, are increasingly utilized to treat many clinical diseases including gastric ulcer (Hirama-Lima et al. 2003). Normacid syrup® (NS) is a polyherbal formulation composed of several medicinal plants. These plants are known to possess antioxidant and antilucer properties and have been used in indigenous systems of medicine to treat gastric ulcers (Rao

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Antilucer

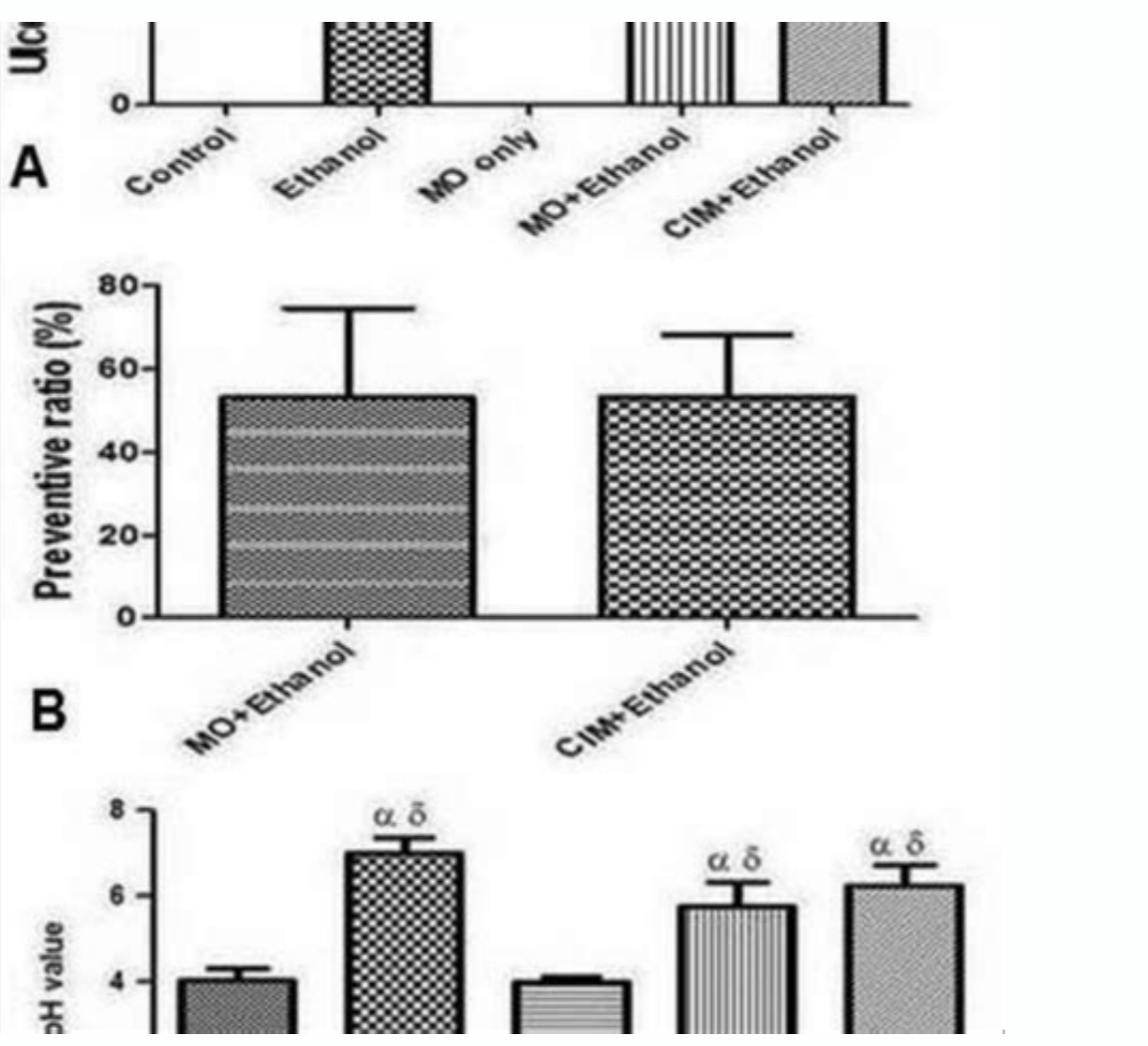
Comparative antilucer activity

The antilucer activity was assessed by measuring the ulcer index, free acidity, total acidity and pH of gastric fluid. The ulcer index was assessed by measuring the ulcer score and ulcer index. The ulcer score was assessed by measuring the ulcer area and ulcer index. The ulcer index was assessed by measuring the ulcer area and ulcer index.



Fig. 1 The antilucer activity of Normacid syrup (NS) in mice. The ulcer index and ulcer score were significantly lower in the MO+Ethanol and CIM+Ethanol groups compared to the Ethanol and MO only groups.

| Group | Ulcer Index (Mean ± SD) | Ulcer Score (Mean ± SD) | Free Acidity (Mean ± SD) | Total Acidity (Mean ± SD) | pH (Mean ± SD) |
|-------------|-------------------------|-------------------------|--------------------------|---------------------------|----------------|
| Control | 1.0 ± 0.2 | 1.0 ± 0.2 | 1.0 ± 0.2 | 1.0 ± 0.2 | 4.0 ± 0.2 |
| Ethanol | 4.5 ± 0.5 | 4.5 ± 0.5 | 4.5 ± 0.5 | 4.5 ± 0.5 | 3.5 ± 0.2 |
| MO only | 3.5 ± 0.4 | 3.5 ± 0.4 | 3.5 ± 0.4 | 3.5 ± 0.4 | 3.8 ± 0.2 |
| MO+Ethanol | 2.5 ± 0.3 | 2.5 ± 0.3 | 2.5 ± 0.3 | 2.5 ± 0.3 | 4.2 ± 0.2 |
| CIM+Ethanol | 2.8 ± 0.3 | 2.8 ± 0.3 | 2.8 ± 0.3 | 2.8 ± 0.3 | 4.1 ± 0.2 |



Anti ulcer activity. Anti gastric ulcer activity. Antiulcer activity of plant extract. Anti ulcer activity definition. Anti-ulcer activity of quercetin. Anti ulcer activity of plants. Antiulcer activity pylorus ligation method. Anti ulcer activity pdf.

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