

In Vivo Antiulcer and Anti-Helicobacter pylori Activity of Geraniol on Acetic Acid plus Helicobacter pylori Induced Ulcer in Rats

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Abstract : Geraniol, an acyclic monoterpenoid is the main active constituent in the essential oils of rose and palmarosa. Antioxidant, antibacterial, anticancer and antiulcer activity of geraniol was reported by many researchers. The present investigation was designed to study in vivo antiulcer and anti-Helicobacter pylori activity of geraniol. Antiulcer and anti-H. pylori activity of geraniol was evaluated on acetic acid plus H. pylori induced ulcer in rats. Acetic acid (0.03 mL) was injected to the sub-serosal layer of the stomach through laparotomy under anaesthesia. Orogastric inoculation of H. pylori (ATCC 43504) was done twice daily for 7 days. Geraniol (15 and 30 mg/kg), vehicle and standard drugs (Amoxicillin, 50 mg/kg; clarithromycin, 25 mg/kg & omeprazole, 20 mg/kg) was administered twice daily for 14 days. Antiulcer activity of geraniol was examined by the determination of gastric ulcer index, measuring the volume of gastric juice, pH and total acidity, myeloperoxidase activity and histopathological examination. Histopathological investigation for the presence of inflammation, white blood cell infiltration, edema, the mucosal damage was studied. The presence of H. pylori was detected by placing a biopsy sample from antral part of the stomach into rapid urease test. Ulcer index in H. pylori inoculated control group was 4.13 ± 0.85 and was significantly ($P < 0.05$) lowered in geraniol (30 mg/kg) and reference drug treated group. Geraniol increase the pH of the gastric juice (2.18 ± 0.13 in control vs. 4.14 ± 0.57 in geraniol 30mg/kg) and lower total acidity significantly ($P < 0.01$) in geraniol (15 & 30 mg/kg). Myeloperoxidase (MPO) activity was measured in stomach homogenate of all the groups. H. pylori control group has significant ($P < 0.05$) increase in MPO activity compared to normal control group. Geraniol (30 mg/kg) was showed significant ($P < 0.05$) and most effective among all the groups. Histopathological examination of rat stomach was scored and the total score for H. pylori control group was 8. After geraniol (30 mg/kg) and reference drug treatment, the histopathological score was significantly decreased and it was observed to be 3.5 and 2.0 respectively. Percentage inhibition of H. pylori infection in geraniol (30 mg/kg) and reference drug were found to be 40% and 50% respectively whereas, 100% infection in H. pylori control group was observed. Geraniol exhibited significant antiulcer and anti- H. pylori activity in the rats. Thus, geraniol has the potential for the further development as an effective medication in treating H. pylori associated ulcer.

Keywords : geraniol, helicobacter pylori atcc 43504, myeloperoxidase, ulcer

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