Pharmacological Reports
2011, 63, 518–526
ISSN 1734-1140

Antiulcerative effect of dexmedetomidine on indomethacin-induced gastric ulcer in rats

Beyzagul Polat[1], Yavuz Albayrak[2], Bahadır Suleyman[1], Hakan Dursun[3], Fehmi Odabasoglu[4], Murat Yigiter[5], Zekai Halici[1], Halis Suleyman[1]

[1]Department of Pharmacology, Faculty of Medicine, [3]Department of Internal Medicine, Division of Gastroenterology, Faculty of Medicine, [4]Department of Biochemistry, Faculty of Pharmacy, [5]Department of Pediatric Surgery, Faculty of Medicine, Ataturk University, 25240 Erzurum, Turkey

[2]Department of General Surgery, Regional Education and Research Hospital, 25240 Erzurum, Turkey

Correspondence: Halis Suleyman, e-mail: halis.suleyman@gmail.com, suleyman@atauni.edu.tr

Abstract:
A gastroprotective effect occurs when α_2 receptors are innervated. The dextro isomer of medetomidine, dexmedetomidine, is a highly selective α_2-adrenoreceptor agonist. The aim of this study was to investigate whether dexmedetomidine has an antiulcerative effect and to show whether the antiulcer mechanism of dexmedetomidine is linked with oxidant/antioxidant parameters. The antiulcerative effect of dexmedetomidine was studied in an indomethacin-induced ulcer model, and some oxidant/antioxidant parameters were measured in these gastric tissues. Whereas the average ulcerous areas for the groups that received 10, 25, 50, and 100 μg/kg dexmedetomidine doses were 29 ± 4.2, 8 ± 2.1, 0 ± 0 and 0 ± 0 mm^2, respectively, the ulcerous area was 52.1 ± 4.5 mm^2 in the indomethacin control group and 0.5 ± 0.2 mm^2 in the famotidine group. In conclusion, the α_2-adrenoreceptor agonist dexmedetomidine showed a significant antiulcerative effect in rat gastric tissue at all doses. This antiulcerative effect is stronger with increasing dosage; at the 50 and 100 μg/kg doses, no ulcerous areas were observed. In light of these results, we conclude that there is a correlation between antiulcer mechanisms and α_2-receptor activation. In rats given dexmedetomidine, all of the investigated antioxidant parameters increased, except for catalase (CAT). Conversely, aside from myeloperoxidase (MPO), all oxidant parameters decreased. Therefore, oxidant/antioxidant parameters play a role in the antiulcer mechanism of dexmedetomidine.

Key words:
dexmedetomidine, indomethacin, oxidant/antioxidant parameters, rat