MELATONIN PROTECTS AGAINST HYDROGEN PEROXIDE-INDUCED GASTRIC INJURY IN RATS

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SUMMARY

1. Melatonin (MT) is a pineal hormone that is also abundant in the gut and has a well known role in scavenging oxygen free radicals. The aim of the present study was to evaluate the potential protective effects of MT against H₂O₂-induced gastric lesions in rats.

2. An experimental model of gastric ulceration was established in rats using 15% H₂O₂. Melatonin (12.5, 25 or 50 mg/kg, intagastically) was administered to rats 30 min before H₂O₂ challenge.

3. Intragastric administration of H₂O₂ resulted in haemorrhagic lesions in the fundic area of the stomach. Furthermore, H₂O₂ induced gastric oxidative stress, as indicated by depletion of reduced glutathione (GSH), inhibition of glutathione peroxidase (GPx) activity and elevation of malondialdehyde (MDA) levels. These effects were accompanied by decreased gastric tissue levels of prostaglandin (PG) E₂ and nitric oxide (NO), as well as increased levels of tumour necrosis factor (TNF)-α. Administration of MT (12.5, 25 or 50 mg/kg) 30 min before H₂O₂ significantly attenuated the development of gastric lesions in a dose-dependent manner. The protective effects of MT were accompanied by significant inhibition of the H₂O₂-induced reduction in gastric content of GSH and GPx activity and elevation in MDA levels. Furthermore, MT antagonized H₂O₂-induced reduction of gastric PGE₂ and NO levels and elevation of TNF-α.

4. In conclusion, MT protects rat gastric mucosa against H₂O₂-induced damage. The observed protective effects of MT can be attributed, at least in part, to its anti-oxidant properties, preservation of PGE₂ and NO levels, as well as inhibition of TNF-α induction in gastric tissues.

Keywords: hydrogen peroxide, melatonin, rat stomach.