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Gastro-Protective Actions of Melatonin and Murraya koenigii Leaf Extract Combination in Piroxicam Treated Male Wistar Rats

Authors : Syed Benazir Firdaus, Debosree Ghosh, Aindrila Chattyopadhyay, Kuladip Jana, Debasish Bandyopadhyay

Abstract : Gastro-toxic effect of piroxicam, a classical non-steroidal anti-inflammatory drug (NSAID), has restricted its use in arthritis and similar diseases. The present study aims to find if a combination of melatonin and Murraya koenigii leaf extract therapy can protect against piroxicam induced ulcerative damage in rats. For this study, rats were divided into four groups namely control group where rats were orally administered distilled water, only combination treated group, piroxicam treated group and combination pre-administered piroxicam treated group. Each group of rats consisted of six animals. Melatonin at a dose of 20mg/kg body weight and antioxidant rich Murraya koenigii leaf extract at a dose of 50 mg /kg body weight were successively administered at 30 minutes interval one hour before oral administration of piroxicam at a dose of 30 mg/kg body weight to Wistar rats in the combination pre-administered piroxicam treated group. The rats of the animal group which was only combination treated were administered both the drugs respectively without piroxicam treatment whereas the piroxicam treated animal group was administered only piroxicam at 30mg/kg body weight without any pre-treatment with the combination. Macroscopic examination along with histo-pathological study of gastric tissue using haemotoxylin-eosin staining and alcian blue dye staining showed protection of the gastric mucosa in the combination pre-administered piroxicam treated group. Determination of adherent mucus content biochemically and collagen content through Image J analysis of picro-sirius stained sections of rat gastric tissue also revealed protective effects of the combination in piroxicam mediated toxicity. Gelatinolytic activity of piroxicam was significantly reduced by pre-administration of the drugs which was well exhibited by the gelatin zymography study of the rat gastric tissue. Mean ulcer index determined from macroscopic study of rat stomach reduced to a minimum (0±0.00; Mean ± Standard error of mean and number of animals in the group=6) indicating the absence of ulcer spots on pre-treatment of rats with the combination. Gastro-friendly prostaglandin (PGE2) which otherwise gets depleted on piroxicam treatment was also well protected when the combination was pre-administered in the rats prior to piroxicam treatment. The requirement of the individual drugs in low doses in this combinatorial therapeutic approach will possibly minimize the cost of therapy as well as it will eliminate the possibility of any pro-oxidant side effects on the use of high doses of antioxidants. Beneficial activity of this combination therapy in the rat model raises the possibility that similar protective actions might be also observed if it is adopted by patients consuming NSAIDs like piroxicam. However, the introduction of any such therapeutic approach is subject to future studies in human.

Keywords : gastro-protective action, melatonin, Murraya koenigii leaf extract, piroxicam
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