Abstract

In the present study the effects of two cyclooxygenase-2 (COX-2) selective inhibitors, celecoxib and nimesulide as compared to a non-selective COX inhibitor, aspirin was studied in the rat intestine. Female Wistar rats weighing between 150-175 g were divided into four groups having 8 animals each as follows: Group 1(Control), Group 2- Aspirin (40 mg/kg), Group 3- Nimesulide (10 mg/kg) and Group 4- Celecoxib (10 mg/kg). After 35 days of treatment the animals were sacrificed, intestine removed and the effects on the antioxidant defense system, membrane composition and functions along with the membrane specific enzymes were studied in different regions of the intestine. The study showed a significant increase in the lipid peroxide levels as TBA-reactive substance as well as the conjugated dienes, except for celecoxib treated group which showed a decrease. Significant decrease was also observed in the level of reduced glutathione (GSH), superoxide dismutase (SOD), glutathione-s-transferase and catalase activities for aspirin and nimesulide group while Celecoxib caused an increase in glutathione reductase (GR). Aspirin and nimesulide exhibited an increase in the brush border membrane (BBM) bound enzyme activities like sucrase, lactase, maltase and alkaline phosphatase in the small intestine while celecoxib showed decrease in lactase, maltase and alkaline phosphatase. The phospholipid content increased only for aspirin treated group while cholesterol decreased in all the treatment groups. Also celecoxib treatment brought about an increase in glycolipid content. The membrane fluidity was studied by the rotational diffusion of 1, 6, diphenyl, 1, 3, 5 hexatriene (DPH) incorporated in the membrane and the fluorescence polarization (p), fluorescence anisotropy(r), anisotropy parameter [r0/r -1]-1 and order parameter [S2 = (4/3r – 0.1)/ r0] were recorded. No significant change in the fluorescence parameters were observed in the BBM and the liposomes made from the BBM lipids for the treatment groups. These results indicate that celecoxib may be accepted as a safer drug in terms of overall gastro-intestinal toxicity as compared to the aspirin and nimesulide. (Nutr Hosp. 2006;21:638-649).

Keywords