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EFFECTS OF DURABLE PROTON PUMP INHIBITORS APPLICATION ON NITRITE IONS CONTENT IN THE BLOOD SERUM AND MUCOUS MEMBRANES OF THE STOMACH AND COLON IN RATS

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ABSTRACT

Introduction: Prolonged use of proton pump inhibitors leads to hypergastrinemia and dysbiosis and as a consequence to the development of the inflammatory process in the gastrointestinal tract.

The aim of the work was to determine nitrite ions content in the blood serum and gastric and colon mucous membranes in rats with prolonged use of proton pump inhibitors Omeprazole and Pantoprazole.

Materials and methods: The studies were performed on 30 white non-linear male rats weighing 160-180 g, divided into three groups of 10 animals in each. The control (group 1) animals were administered intraperitoneally water for injection within 28 days once a day. Group 2 was administered omeprazole. Group 3 was administered Pantoprazole. The content of nitrite ions in the blood serum and mucous membranes of the stomach and colon of rats was determined by the Griess method. For statistical data processing, Student's t-criterion for independent samples was applied.

Results: After prolonged administration of omeprazole and pantoprazole, the blood serum NO^{2-} concentration increased by 24% ($p < 0.05$) and 13% compared to the control. The increase in the concentration of NO^{2-} in the mucous membranes of the stomach and colon after the 28-days inhibition of HCl secretion in the stomach with Omeprazole and Pantoprazole was significantly more pronounced and was in the stomach – by 144% ($p < 0.05$) and by 85% ($p < 0.05$) more compared to the control. In the colon mucosa, it was by 159% ($p < 0.05$) and by 119% more than in the control group.

Conclusion: Prolonged inhibition of hydrochloric acid secretion in the stomach of rats by proton pump blockers Omeprazole and Pantoprazole resulted in excessive generation of nitric oxide in the blood serum and mucous membranes of the rat digestive tract. The adverse effect of pantoprazole was less pronounced than that of omeprazole.

KEY WORDS: hypochlorhydria, pantoprazole, omeprazole, inflammatory process.