**ACTION OF SODIUM POLY-(2,5-DYHIDROKSYFENILEN)-4-THIOSULFATE ACID (PDT-NA) ON THE ANTIOXIDANT PROTECTION’S STATE IN ETHYLENEGLYCOL’S RATS MODEL OF ACUTE KIDNEY INJURY**

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Early we did analysis of the problem of treatment acute kidney injury (AKI). We showed AKI have primarily become a nosocomial disease in the developed world (Chertow G.M. at al. (2005) described AKI has an incidence of 5–7% in hospitalized patients). So the efficacy of AКI treatment remains a worldwide acute problem.

The investigation PICARD (Project to Improve Care in Acute Renal Disease) demonstrated that AKI in critically ill patients was associated with significantly more oxidative stress. Pharmacotherapy of AKI include using the nephroprotectors with membranestabilizing, antiinflammatory, antihypoxic activity which in the mechanism of action should has the antioxidant effect. Same properties has sodium poly-(2,5-dihydroxyphenylene)-4-thiosulfate acid (PDT-Na) with proven antihypoxic activity. In our previous studies was established nephroprotective effect of antihypoxicant PDT-Na in experimental acute renal failure of various geneses, not inferior to the effects of reference drugs mexidol, hofitol and tiotriazolin.

Thus the purpose of this work is study of sodium poly-(2,5-dyhidroksyfenylen)-4-thiosulfate acid’s influence on the antioxidant protection’s state in ethylene glycol’s model acute kidney injury of rats in comparison with the antihypoxant mexidol, antioxidant tiotriazoline and plant nephroprotective drug hofitol. The experiment performed with 36 white nonlinear albino rats weighing 200-220 g according to the European convention for the protection of vertebrate animals used for experimental and other scientific purposes (Strasbourg, 1986) and according to the guidelines of the State Expert Center Ministry of Health of Ukraine. The rats were divided into 6 groups: intact control (1) and 5 groups that were given ethylene glycol AКI: control pathology (2), and four treatment groups with PDT-Na (3), mexidol (4),thiotriazoline (5) and hofitol (6). At the end of the study, the animals were taken out of the experiment according to bioethical principles. Were collected animals blood and kidneys were removed to prepare biological substrates for further biochemical studies. An assessment was made of the state of antioxidant protection in the blood and in the kidney homogenate against the background of AKI and under the influence of PDT-Na and reference agents in the activity of antioxidant protection enzymes of catalase and superoxide dismutase (SOD) and the level of accumulation of SH-groups (GSH).

This experiment showed that one of mechanisms of acute kidney injury by ethylene glycol is a failure in the system of antioxidant protection of the organism. Ethylene glycol suppresses the state of antioxidant’s defense of the organism, which is indicated by a decrease in blood and a renal homogenate of the activity of enzymes of antioxidant protection. The catalase activity in the blood and kidney homogenate reliable in relation to the intact control decreased by 1.22 times and 2.27 times respectively, of SOD – by 1.60 times and by 1.51 times respectively. Ethylene glycol is reliable relatively to the intact decreased the level of renal and endogenous sulfur-containing antioxidant of reduced GSH glutathione in the blood and kidney tissues by 1.50 times and 1.71 times respectively.

The application of PDT-Na and mexidol under conditions of ethylene glycol AKI promoted the normalization of the state of antioxidant defense in the body of rats, increasing the activity of catalase, SOD and GSH in the blood and in the kidney tissues. The drug PDT-Na is reliable relatively to the control pathology, it increased enzyme activity in the blood and kidney homogenate: catalase – by 1.14 times and by 1.97 times, respectively, SOD – by 1.34 times and by 1.28 times, respectively, GSH content – by 1.42 times and by 1.53 times, respectively. Comparator, mexidol reliably increased the catalase level in blood and kidney tissues by 1.10 times and 1.86 times, respectively, SOD – by 1.29 times and by 1.25 times, respectively, and GSH content – by 1.41 times and by 1.51 times relatively to the animals of the control pathology group.

The comparator hofitol in terms of antioxidant effect was inferior to the investigated drug PDT-Na and the reference drug mexidol. Thus hofitol increased the activity of catalase enzymes by 1.05 times and 1.52 times respectively, SOD – by 1.14 times and by 1.16 times respectively, and the level of GSH – by 1.24 times and by 1.41 times respectively.

The comparator thiotriazolin as well as PDT-Na and mexidol showed a strong antioxidant effect. It was established the significant increase of the catalase activity in the blood and in the kidney tissues by 1.15 times and 1.99 times respectively, of SOD – by 1.28 times and by 1.22 times respectively, of GSH – by 1.40 times and by 1.52 times respectively.

It was found that antihypoxant PDT-Na and reference drugs meksidol, plant nephroprotector hofitol and antioxidant thiotriazolin in conditions of ethylene glycol acute kidney injury showed good antioxidant properties. Antihypoxants PDT-Na and meksidol and antioxidant tiotriazolin exhibit antioxidant action at the same level and have antioxidant effect which prevails to hofitol.

Thus in our investigation was found that antihypoxant PDT-Na with previously established nephroprotective activity has antihypoxic, antioxidant, antiradical and cytoprotective properties and it is a promising drug for complex treatment of acute kidney diseases.