of gentamicin nephropathy, it's advisable to use medicines with antioxidant properties for the prophylactic and correction of this pathology.Glutathione functionates as a hydrogen donor and a cofactor of principal antioxidant enzymes – glutathione peroxidase and glutathione reductase [AoyamaK.,2015].

The aim of research was to estimate a nephroprotective potential of glutathione on a model of gentamicin-induced acute kidney injury.

The research was conducted on 21 non-linear white rats weighting 140-180 g, maintained under the standard vivarium conditions with free access to water and food. Animals were divided into three groups (n=7): 1st group – control, 2nd – animals with gentamicin nephropathy, induced by the dailyinjectionof 4% gentamicin solution in dose 80 mg/kg during 6 days, animals of the 3rd group were dailyinjected by glutathione preparation (TAD 600, "BiomedicaFoscama", Italy) in dose 30 mg/kg 40 min after gentamicin administration. Kidney function was assessed 24 h after the last gentamicin injection by the indices of diuresis, creatinine plasma concentration(Pcr), glomerular filtration rate (GFR) and protein concentration in urine(Uprot).

Progression of severe kidney injury after gentamicin administration resulted in the reduction of diuresis by 62% ($p<0.01$), decrease of GFR by 2.4 times ($p<0.01$) with the development of retentional azotemia,confirmed by an increase of Pcr by 72% ($p<0.01$) comparing to control group. Uprot concentration increased by 3.2 times ($p<0.01$),indicating the critical proteinuria caused by tubular damage.

Administration of glutathione significantly improved the excretory kidney function. Diuresis increased by 1.7 times ($p<0.01$),GFR – by 1.8 times ($p<0.01$), what was accompanied by the reduction of Pcr by 52%. Additionally, proteinuria decreased by 2.3 times ($p<0.01$), protein excretion – by 1.5 times($p<0.01$)in comparison to the untreated animals. Obtained results testify the ability of glutathione to mitigate toxic effects of gentamicin, extending the spectrum of its clinical use.

Filipets N. D.

THE CHANGES OF ENERGY METABOLISM IN THE TISSUE OF KIDNEYS AFTER SUBLIMATE DAMAGE AND MODULATION OF POTASSIUM FLOW WITH FLOCALIN

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A wide range of kidney diseases are caused by toxicants including heavy metals that determine violation of homeostatic kidney function. Nephrotoxicity is caused by the complexes of divalent metals with proteins. These complexes damage epithelium of tubulocytes during reabsorption with selective lesion of cellular membranes, mitochondria, and inhibit energy dependent transport processes in the tubular part of nephron. It is well known that potassium channels are a potent endogenous system of defense of the organism when energy resources of cells (including ATP) decrease. The aim of research was to study the changes of energy metabolism in the tissue of kidneys under the conditions of acute sublimate kidney injury after administration of flocalin which is ATP-dependent potassium channel activator of sarcolemmal and mitochondrial cell membranes.

The experiments were held on nonlinear laboratory white rats of both sexes 150-170 g of weight after a single and multiple (7 days) intraventricular administration of flocalin 5 mg/kg. Sublimate nephropathy was modeled by subcutaneous injection of 0.1% mercury dichloride 5 mg/kg. The activity of alkaline phosphatase (AP) in the cortical layer of kidney was measured on photocolorimeter KFK-2 according to instruction due to the ability of the enzyme to slit phenilphospate with production of phenol. The activity of succinate dehydrogenase (SDH) in cortical and medullary layers of kidney was measured on spectrophotometer according to contents of restored potassium ferricyanide (Prokhorova M.I., 1982). Biochemical research at the day of modeling of renal pathology has shown the decrease of AP activity by 20.3% in comparison to healthy rats. Activity of SDH decreased by 41.9% in the cortical and by 40% in the medullar layers of kidneys. After a single administration of flocalin to the rats with sublimate nephropathy the activity of AP increased by 12.5%. The activity of SDH in the medullary layer of kidney did not reach the level of intact rats. At the same time, the elevation of this enzyme in the cortical layer comprised 29.6%. On the 7^{th} day of acute sublimate nephropathy a decrease of both AP (by 67.7%) and SDH (by 30.8% and 45% in cortical and medullary layers respectively) was observed. After 7 days of flocalin administration AP increased by 41.3% and SDH increased by 19.6% in the cortical layer of kidneys. Therefore under the conditions of toxic kidney injury to prevent excessive accumulation of cytoplasmic calcium ions, pharmacological modulation of K_{ATP} channels is very important. The increase of AP activity which is donator of phosphor for ATP, as well as the increase of SDH activity which is marker of functional state of mitochondria, show the ability of flocalin to improve energy supplement to the nephrocytes.

Kmet O. G.

STUDY OF THE EFFECT OF DIFFERENT PIRACETAM DOSAGES ON THE CONDITION OF PROOXIDANT-ANTIOXIDANT SYSTEM OF CERTAIN BRAIN STRUCTURES IN CASE OF ACUTE HYPOXIA

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Hypoxia is the basic condition in pathogenesis of numerous neurologic diseases. According to the data of publications, pharmaco-therapeutic issues of cerebral pathology, being the third in the list of general mortality rate in

Ukraine, have acquired special medical and social significance. Hypoxia is a rare etiologic factor in clinical manifestation. It often aggravates the course of the underlying disease and is accompanied by disturbances of oxygen transport system and joins regulatory dysfunctions and involvement of typical and specific pathologic reactions.

There is a great number of preparations which influence the process of brain hypoxia in different ways at the pharmacological market of Ukraine. However, there aren't any remedies for other neuro- and psychopharmacologic groups which do not possess such a composite many-sided spectrum of pharmacologic activity as neotropical drugs have. In particular, a lot of studies deal withPiracetam, which so far remains "the pattern", "the golden standard" of neotropical preparations.

The objectiveof the study was to investigate the effect of different doses of Piracetam on prooxidant-antioxidant system of certain brain structures in case of acute hypobaric hypoxia.

The experiments were conducted on immature and mature outbred male albinorats with a moderate resistance to hypoxia. The animals were divided into the following groups: 1) animals subjected to hypoxia after preliminary injection of saline; 2) rats subjected to hypoxia after preliminary injection of Piracetam in different doses. A single dosage of the preparation was administered intraperitoneally in doses of 100, 200, 300, 400, 500 mg/kg correspondingly. Considering pharmokinetics of Piracetam, the preparation was injected one hour before hypoxia modeling. The obtained data were analyzed by the methods of variation statistics, using the Students' t-criterion.

The investigations were indicative of the fact that Piracetam injection 60 minutes before hypoxia modeling in the dosages of 100, 300, 400, 500 mg/kg resulted in imbalanced prooxidant-antioxidant system in the examined brain structures. However, after administration of Piracetam in the dosage of 200 mg/kg, the content of TBAAP and products of protein oxidation modification decreased, the activity of enzyme antioxidant defense increased - catalase activity reliably raised in all the brain structures. At the same time G-6-FDG activity decreased reliably. The activity of Na+, K+ - AT phase reliably decreased. The activity of Na+, K+ -AT phase was registered twice as much in the cerebral cortex, 2,3 times as much in the hyppocampus, 2,4 as much in blidiycula, 4 times as much in caudate nucleas, as compared to the animals subjected to hypoxia without injection of the preparation.

Thus, Piracetam in the dosage of 200 mg/kg normalizes the disturbed prooxidant-antioxidant balance in the brain structures as the result of acute hypoxia much better than in other dosages (100, 300, 400, 500 mg/kg).

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POTASSIUM-URETIC ACTION OF TRENTAL AND XANTHINOL NICOTINATE UNDER CONDITIONS OF SPONTANEOUS DIURESIS

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Trental and xanthinol nicotinate are synthetic dimethyl xanthines with marked hemorheological properties which, apart from peripheral vessels dilation and microcirculation improvement, increase diuresis and electrolyte excretion. It has been discovered in our previous studies that the drugs under study show saluretic effect more significantly than diuretic one by increasing the egestion of sodium ions by kidneys. At the same time potassium-uretic action of the drugs has been studied not enough, the existing information is contradictory.

The aim of the study was to ascertain potassium-uretic action of trental and xanthinol nicotinate with spontaneous diuresis.

Material and methods of the study. Experiments were carried out on mature albino rats with body weight of 0,12-0,18 kg, being kept in individual interchangeable cages on constant diet with an unlimited water and food consumption. In order to study the comparative effect of methyl xanthinol drugs on potassium-uresis, the animals have been daily peritoneally injected with Trental ("Host", Turkey) and xanthinol nicotinate ("Galichpharm", Lviv) in the dosage of 3 mg/kg for 7 days. And we have observed changes in daily diuresis and excretion of potassium ions in the dynamics of the experiment. After the last injection the urine had still been taken for 4 days, and the changes of potassium-uresis have been studied. The concentration of potassium ions in urine was determined by flame photometry on FPL-1 method.

The results of the study. After a single injection of animals with either trental or xanthinol nicotinate potassium-uretic action of both xanthine drugs hasn't considerably changed. With the aim to form more complete notion of the renal functional condition the dynamics of diuresis and potassium-urine daily changes in animals have been observed. Urine excretion and potassium ions content in it have been gradually increasing by injections of methyl xanthil preparations for a long period of time. The analysis of potassium-uresis successive dynamics testifies that trental significantly increases potassium ions excretion starting from the fourth day of the experiment, while xanthinol nicotinate from the third day. The maximum excretion of potassium ions with urine under the influence of the drugs has been observed on the seventh day of administration of the drugs. Potassium-uresis increases by 60% under the influence of trental and by 45% xanthinol nicotinate, while diuretic action of methyl xanthin drugs was approximately the same and exceeded the control indications by 1,2 - 1,3 times correspondingly. The comparison of potassium-uretic effect of the preparations under study shows that trental is a more significant potassium-uretic, under its influence potassium-uresis was 9% higher than that of xanthinol nicotinate. The observed changes of potassium ions excretion continued to keep up for another day after the injections of the drugs were stopped, potassium-uresis indications returned to the control level after that.