This complexing agent, a donor of sulfur ions, easily reacting with various chemical compounds and oxidizing, acts as a strong reducing agent, forms low-toxic and non-toxic compounds with cyanides, heavy metal salts, and halogens.

The drug has antidote properties in relation to hydrocyanic acid and cyanides, phenols, benzene, aniline, compounds of mercury, lead, arsenic, copper, chlorine, iodine, bromine, which makes it possible to use it in the complex treatment of poisoning, allergic diseases, as well as burns, arthritis, neuralgia, diabetic neuropathy. STS has also been shown to be effective in the treatment of calciphylaxis, a formidable complication in patients with severe renal failure on hemodialysis, resulting from calcium deposition in the intima of arterioles and characterized by nodular subcutaneous calcification and painful tissue necrosis, often leading to skin ulceration, secondary infection and high one-year mortality from sepsis (45%-80%). STS displaces calcium ions from sediments to form calcium thiosulfate, which is excreted by the kidneys or is dialyzed. Diabetes mellitus, obesity, the use of calcium-containing agents and dietary supplements, active vitamin D, warfarin, corticosteroids, iron preparations, and trauma associated with subcutaneous administration of heparin or insulin increase the risk of developing calciphylaxis. STS, a reversible oxidation product of hydrogen sulfide, has vasodilation and anti-oxidative properties, making it an attractive agent to alleviate damaging effects of hypertension. Combining thiosulfate of sodium with angiotensin converting enzyme inhibitors further lowered renal vascular resistance and prevented glomerulosclerosis.

Thus, these data suggest that thiosulfate has therapeutic potential in hypertensive renal disease and might be of value when added to standard antihypertensive therapies. In addition, STS attenuates glial-mediated neuroinflammation in degenerative neurological diseases by increasing the expression of sulfhydryl groups and glutathione in cultures of microglia and astrocytes. Since neuroinflammation has been found to occur in degenerative neurological diseases such as Alzheimer's and Parkinson's, STS is a potential therapeutic agent for these and other neurodegenerative diseases and deserves attention for further study.

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ANTIOXIDANT POTENTIAL OF GLUTATHIONE IN THE CONDITIONS OF DEVELOPMENT OF ACETAMINOPHEN-INDUCED ACUTE RENAL INJURY

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Despite significant advances in drug therapy and improvements in renal replacement therapy, mortality rate of acute kidney injury (AKI) continuously increases and is about 25-70%. On the other hand, Acetaminophen is frequently used for analgesia and is considered safer than nonsteroidal anti-inflammatory drugs (NSAIDs) for the kidneys. However, there is little epidemiological evidence of the association between Acetaminophen and development of AKI. Renal insufficiency occurs in approximately 7-15% of patients with acetaminophen overdose. For this reason, potent cytoprotector and antioxidant – glutathione has drawn our attention as remedies for the pathogenetic correction of Acetaminophen-induce AKI.

Aim of research – to study antioxidant potential of glutathione in conditions of Acetaminophen-induce AKI in rats. Research was conducted on 21 mature non-linear white rats weighting 130-180 g, randomly divided into 3 groups (n = 7): I group – intact control, II group – Acetaminophen-induce AKI (Acetaminophen-induced AKI was caused by a single intraperitoneal administration of acetaminophen (paracetamol, Health, Ukraine) at a dose of 750 mg/kg), rats of III group were daily administered with glutathione (TAD 600, Biomedica Foscama, Italy) at a dose of 30 mg/kg, 1 h after paracetamol injection. Animals were withdrawn from the experiment 24 h after the last injection, while blood, urine were sampled for biochemical assessments. Peroxidation processes in kidneys were evaluated by the malone dialdehyde and oxidative modification of proteins levels, antioxidant defense – by catalase and glutathione peroxidase activity, and SH-groups content.

In the course of experimental studies on the model of Acetaminophen-induce AKI, the expressive antioxidant activity of glutathione was proved, which which was confirmed by the decrease in lipid and protein peroxidation processes in blood plasma and renal tissue, as well as an enhancement of enzymatic activity (increase in activity of endogenous glutathione peroxidase in blood plasma by 24,6%, in kidney tissue by 34,9%), and on the non-enzymatic level of the antioxidant defence (increase in the SH groups level by 25,1%, decrease of ceruloplasmin – by 22,2%) compared to the model pathology group.

The antioxidant potential of glutathione is confirmed by an increase in the antioxidant-prooxidant index in kidney tissue and a significant decrease in the index of oxidative stress in the blood of treated animals. The cytoprotective effect of glutathione was confirmed by a reduction in gamma-glutamyltranspeptidase activity in urine by 2,4 times ($p<0.01$) compared to untreated animals. Maintenance of the cellular energy balance is an important mechanism of the nephroprotective effect. Co-treatment with glutathione contributed to an increase in the activity of succinate dehydrogenase by 1.5 times compared with Acetaminophen-induce AKI. Under the conditions of renal damage, glutathione promotes the compensatory activation of the aerobic glycolysis and activates the energy-synthesizing function of nephrocytes.

The results of the experimental studies show the nephroprotective activity of glutathione in conditions of Acetaminophen-induce AKI. Nephroprotective effect manifests restoration of the prooxidant-antioxidant and energy balance in kidneys of animals with Acetaminophen-induce AKI. The obtained results substantiate the relevance of further research to broaden the spectrum of glutathione use and optimize the pharmacotherapy of renal pathology.

Ezhned M.A.

MARKETING ANALYSIS OF PHYTODRUGS BASED ON MARSHMALLOW (ALTHAEA OFFICINALIS L.)

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The use of plants as drugs has a long history. The first mention of medicinal plants and their properties are found in the earliest written records of human culture and morphological descriptions of plants and their use date back to the 7th century B.C. One of such widely used plants was marshmallow (*Althaea officinalis L.*), which is used since the IV century. B.C. The tradition of marshmallow usage has survived to our time. Therefore, a deeper study of this plant and drugs based on it is still relevant.

Therefore, the aim of the study was to conduct a marketing analysis of the phytodrugs range based on *Althaea officinalis*, which are presented on the pharmaceutical market of Ukraine.

Marshmallow drugs are used to treat the acute and chronic inflammatory diseases of the respiratory system, gastrointestinal tract, ulcers and wounds and have expectorant, enveloping and anti-inflammatory effects; they are also used as an external remedy for joint and muscle pain as well as relaxing and helping emollient.

The first stage of the study was to establish the range of phytodrugs which include marshmallow. The pharmaceutical market of Ukraine is found to represent 28 names of drugs based on marshmallow.

The next stage was to study phytodrugs based on *Althaea officinalis* in accordance with the presented dosage forms. The largest share is made up of syrups - 36%, tablets – 21%, herbal compositions - 14% and chewable tablets - 11%. Other dosage forms (tinctures, oral drops, sprays, lollipops, powders for internal use) account for a total of 18%.

The final stage was the pharmaceutical market analysis according to the country of manufacture. The largest number of presented phytodrugs were domestic producers (23 items) and 5 items of foreign production, which is 82% and 18% respectively.

The data analysis of the State Registration of Medicinal Products established that the leading positions in the pharmaceutical market are occupied by domestic manufacturers, which over time