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Research Article

STUDY OF THE INFLUENCE OF THE DIURETIC PREPARATION "ECUSTIM" ON THE ELECTROLYTE BALANCE AND THE LEVEL OF CREATININE AND UREA IN THE URINE

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ABSTRACT

The article presents the results of studying the effect of the drug "Ecustim" on the electrolyte balance and the level of creatinine and urea in the urine. The diuretic activity of the drug "Ecustim" was studied on 24 white rats weighing 125-140 g. The volume of excreted urine was measured, and the concentration of potassium and sodium ions was determined by spectrometry on the ICP-MS spectrometer "Nexion-2000" USA. The drug "Ecustim" administered once intragastrically at a dose of 100 mg/kg, for 8 hours of observation increases diuresis 2.5 times more. With the introduction of the drug at a dose of 150 mg/kg, diuresis increases by 3.1 times, respectively. The experiment also determined the content of urea and creatinine in the urine. The drug "Ecustim" at a dose of 100 mg / kg stimulates the excretion of urea by 1.5 times and the excretion of creatinine by 1.4 times more than in the control group.

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KEYWORDS

Drug "Ecustim", medicinal plants, electrolyte balance, urea, diuretic activity.

INTRODUCTION

Currently, in medical practice, an important place belongs to herbal medicines, as they have a wide range of biological effects, which allows them to be used for the prevention and treatment of many diseases. Herbal preparations contain substances created in a living system, and therefore can organically participate in the metabolic processes of the human body, which allows them to be used in chronic diseases for a long time. It is for this reason that herbal preparations are usually less allergenic than synthetic drugs. They have a number of undeniable advantages: low toxicity, easy digestibility by the human body, the possibility of their long-term use without the risk of side effects, softness and reliability of action. In the last decade, there has been an increased interest of practical medicine in medicines derived from plant or animal raw materials all over the world [1].

At the Uzbek Scientific - Research Chemical-Pharmaceutical Institute named after. A. Sultanov, a new diuretic drug was created — "Ecustim" [2-3]. The drug "Ecustim" consists of a mixture of dry extracts of the following 8 medicinal plants: false yantak herb, woolly herb herb, horsetail herb, creeping tribulus herb, yarrow flowers, cucumber seeds, columns with stigmas of corn and licorice roots. The drug "Ecustim" has an effective diuretic effect, refers to low-toxic substances and does not have cumulative, locally irritating and allergic effects [4].

Purpose of the study. Study of the effect of the diuretic drug "Ecustim" on the electrolyte balance and on the level of creatinine and urea in the urine.

EXPERIMENTAL PART

Materials and methods. The study of diuretic activity, the determination of electrolytes (K + and Na +), urea and creatinine in the urine with a single administration of the drug "Ecustim" was carried out at the Scientific Center for Standardization of Medicines (DVSIM) and in the laboratory of Vitros Diagnostics LLC.

The diuretic activity of the drug "Ecustim" was studied on 24 white rats, weighing 125-140 g, of mixed sex according to the methodological recommendation of R.U. Khabriev [5]. Animals received intragastric water load in the amount of 25 mg/kg. Then the animals of the experimental group were given oral administration of the drug

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in the form of a suspension at a dose of 100 mg/kg and 150 mg/kg. Animals of the control group were injected with distilled water in the appropriate volume. Animals were placed in exchange cages and urine was collected for 8 hours the collected portions of urine were examined. The volume of excreted urine was measured, and the concentration of potassium and sodium ions was determined by spectrometry on the ICP-MS spectrometer "Nexion-2000" USA. To assess the severity of renal failure after 8 hours of the experimental period, the content of creatinine and urea in the urine was determined in the laboratory of Vitros Diagnostics LLC on the Automatic Immunochemical Equipment Analyzer of "OrthoClinicaDiagnostics - Johnson & Johnson" USA.

RESULTS AND DISCUSSION

The drug "Ecustim" administered once intragastrically at a dose of 100 mg/kg, during 8 hours of observation increases diuresis from 2.05±0.14 ml to 5.19±0.24 ml, i.e. 2.5 times more. With the introduction of the drug at a dose of 150 mg / kg, diuresis increases by 3.1 times, respectively.

Potassium excretion when administered at a dose of 100 mg/kg increases from 70.7±1.37 to 200.0±2.28 mg/g (ppm), when administered at a dose of 150 mg/kg increases from 70.7±1 .37 to 300.2±3.51 mg/l (ppm). In the experiment during this period, sodium urea increased from 30.4±0.88 to 90.5±1.98 mg/l (ppm) and 118.9±1.51 mg/l (ppm), respectively. The data are presented in table 1.

Table 1

The effect of the drug "Ecustim" on diuresis and the concentration of sodium and potassium electrolytes (M±m; n=6)

A drug	Urine volume ml/100 g	Concentration, mg/l	
		K^+	Na^+
Control (distant water)	2,05±0,14	70,7±1,37	30,4±0,88
Ecustim 100 mg/kg	5,19±0,24*	200,0±2,28*	90,5±1,98*
Ecustim 100 mg/kg	6,42±0,28*	300,2±3,51*	118,9±1,51*

Note: *- significance of differences in comparison with control at p <0.05

The experiment also determined the content of urea and creatinine in the urine. The drug "Ecustim" at a dose of 100 mg/kg stimulates urea excretion from 66.1±2.7 to 102.0±2.6 mmol/l (1.5 times more than in the control group) and creatinine excretion from 962, 8±31.5 to 1367.2±25.2 mmol/l (1.4 times more than in the control group). "Ecustim" at a dose of 150 mg / kg

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under similar experimental conditions does not affect the excretion of urea from the body, i.e. indicators in the control and experimental groups do not differ significantly.

Table 2

The effect of the drug "Ecustim" on the content of urea and creatinine in the urine (M±m; n=6)

A drug	Indicator	
	Urea mmol/l	Creatinine mmol/mol
Control (distilled water)	66,1±2,7	962,8±31,5
Ecustim 100 mg/kg	102,0±2,6*	1367,2±25,2*
Ecustim 100 mg/kg	59,5±3,51	1257,5±23,2*

Note: *- significance of differences in comparison with control at p <0.05

CONCLUSION

The drug "Ecustim" when taken orally has a diuretic effect and at the same time causes an increase in the excretion of electrolytes (K + and Na +), urea and creatinine. An analysis of the results obtained shows that an increase in the level of sodium and potassium ions in the urine makes it possible to exclude renal pathology. An increase in creatinine in the excreted urine of animals confirms an improvement in the filtration capacity of the kidneys, and an increase in urea indicates an increase in the excretory function of the kidneys.

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