

Pathophysiological analysis of the study of glycerol nephropathy using vegetative resonance test "IMEDIS-TEST +"

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Purpose of the study: to find out the possibilities of diagnosing glycerol nephropathy in rats using the vegetative resonance test (ART) "IMEDIS-TEST +" in conditions of water diuresis.

In the study of glycerol nephropathy in rats 24 hours after a single injection of glycerol in the form of a 50% solution at a dose of 8 mg / kg of body weight, a decrease in urine output, glomerular filtration, absolute, distal, proximal reabsorption of sodium ions. An increase in the concentration of creatinine, protein, and potassium ions was found in the urine (Table 1).

The study of renal function and hormonal-messenger systems of sodium ion homeostasis using the ART "IMEDIS-TEST +" showed an increase in the concentration of creatinine, protein, potassium ions in the urine, which corresponded to the data obtained by objective conventional research methods. (Table 2). In addition, an increase in the concentration of urea and lithium was detected in the urine, and glycerin was detected. Revealed the activation of the renin-angiotensin-aldosterone system with an increase in the concentration of renin, angiotensin 2, aldosterone in the urine.

Table 1

Indicators of renal function in glycerol nephropathy under conditions of water load in a volume of 5% of body weight in the study by conventional methods of assessment (x Sx)

Renal function indicators	The control	Glycerol nephropathy (24 hours)
Diuresis, ml / 2 hours 100 g	3.89 0.313	2.00 0.542 p <0.02
Concentration of potassium ions in urine, mmol / l	7.50 1,673	10.00 3.232
Concentration of creatinine in urine, mmol / l	0.909 0.0510	1.931 0.3401 p <0.02
Plasma creatinine concentration, μmol / l	67.2 7,781	221.0 42.47 p <0.01
Glomerular filtration, μl / min 100 g	468.3 81.98	182.7 74.25 p <0.05
Absolute reabsorption sodium ions, μmol / 2 hours 100 g	59.26 10,880	21.72 8,932 p <0.05
Distal reabsorption of sodium ions, μmol / 2 hours 100 g	484.8 34.76	236.4 64.83 p <0.01
Proximal reabsorption of sodium ions, mmol / 2 hours 100 g	6.62 1.285	2.37 1.008 p <0.05
Protein concentration in urine mg / ml	0.098 0.0362	0.154 0.0341

p - reliability of differences in comparison with control

table 2

Indicators of renal function in glycerol nephropathy under conditions of water load in a volume of 5% of body weight in the study of rats using ART "IMEDIS-TEST +" (x Sx)

Renal function indicators	The control	Glycerol nephropathy (24 hours)
Concentration of potassium ions in urine, conventional units	9.8 0.20	15.4 0.24 p <0.001
Concentration of creatinine in urine, conventional units	6.4 0.24	16.4 0.24 p <0.001
Concentration of urea in urine, conventional units	7.0 0.00	17.2 0.20 p <0.001
Concentration of lithium ions in urine, standard units	11.2 0.20	18.0 0.00 p <0.001
Concentration of aldosterone in urine, conventional units	9.6 0.24	14.0 0.00 p <0.001
Renin concentration in urine, conventional units	6.0 0.00	18.2 0.20 p <0.001
Concentration of angiotensin II in urine, arb.	6.0 0.00	17.2 0.20 p <0.001
Glycerin concentration in urine, conventional units	0.0 0.00	12.4 0.24 p <0.001
Protein concentration in urine, conventional units	4.2 0.20	8.0 0.00 p <0.001

p - reliability of differences in comparison with control

Damage to the proximal nephron in glycerolic nephropathy is confirmed by an increase in protein concentration, a decrease in proximal reabsorption of sodium ions, and an increase in the concentration of lithium in urine (lithium ions are reabsorbed exclusively in the proximal nephron). Damage to the proximal nephron was accompanied by an increase in sodium ion delivery to the macula densa of the distal nephron with activation of tubulo-glomerular feedback reactivity, as indicated by an increase in the concentration of renin, angiotensin 2, and aldosterone in urine. These changes were also confirmed by generally accepted research methods, as indicated by a decrease in glomerular filtration and the development of retention azotemia with an increase in the concentration of creatinine in the blood plasma, since angiotensin 2 causes spasm of the afferent arteriole with a decrease in renal cortical blood flow and glomerular filtration. A decrease in the distal reabsorption of sodium ions also indicated damage to this part of the nephron in glycerol nephropathy.

Conclusions:

1. The method of vegetative resonance test "IMEDIS-TEST +" makes it possible to objectively assess the nature of renal function restructuring in glycerol nephropathy, which is confirmed by an increase in the concentration of creatinine, protein, potassium ions in the urine when assessed by both conventional research methods and ART +.

2. The method of vegetative resonance test "IMEDIS-TEST +" makes it possible to identify glycerin in the urine of rats, to which it was previously injected.

The prospect of scientific research is the further use of the ART method "IMEDIS-TEST +" for lifetime appraisals biological parameters at experimental animals with kidney disease.

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