RENOPROTECTIVE EFFECT OF PENTOXIFYLLINE AT PATIENTS WITH CKD 2-5 STAGE

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OBJECTIVES

Introduction. Almost all forms of chronic kidney disease (CKD) progressing to end-stage kidney failure regardless of the initial injury. Renoprotection contributes longer preservation of renal function. Therefore, one of the important problems of nephrology is to reveal renoprotective effect of drugs. Limited human studies determined that pentoxifylline reduces proteinuria and there is a suggestion that it can improve the renal outcome at patients with CKD.
Aim of the study was to determine renoprotective effect of pentoxifylline in patients with CKD.

METHODS

We examined 146 patients with renal insufficiency, who had CKD 2-5 stages. All patients underwent clinical and instrumental examination, including blood and urine analysis, ultrasound and dopplerography. GFR was estimated by EPI. All patients had received pentoxifylline 5ml diffused with 200 ml of NaCl 0.9% solution. The course of treatment was 7 days. Control analyzes included urinalysis to assess changes in proteinuria and blood chemistry (determination of creatinine and urea).

RESULTS

The age of patients ranged from 17 to 66 years. Mean age was 39,6±13,2 years. 105 were women (72%) and 41 were men (28%). The most frequent cause of renal failure was hypertension – 61 patients (41.2%). In 41 patients CKD was caused by chronic glomerulonephritis, in 18 patients - diabetic nephropathy. 10 patients suffered from polycystic kidney disease, in 12 patients CKD was identified after unilateral nephrectomy for hydronephrosis, contracted kidney and staghorn calculi. 4 patients were operated in childhood for congenital anomalies of the urinary tract – neuromuscular dysplasia of ureter, they had stage 4 CKD. After GFR estimation, we revealed that CKD 2 stage was determined at 12 patients (8.2%), CKD 3 stage – at 66 patients (45.2%), CKD 4 stage – 51 patients (35%) and CKD 5 stage – 17 patients (11.6%). Treatment control was made after 7 days (Table 1). Side effects of pentoxifylline developed in 7 patients (4.8%) on 1-3 days of infusion. Patients reported significant headaches, nausea, vomiting, dyspnea. No changes in serum creatinine level were in 38 patients (26%).

Table 1. Results of a seven-day course of pentoxifylline in patients with renal insufficiency.

CKD stage (number of patients)	Treatment results					
	Decrease of blood creatinine		Decrease of proteinuria		Increase of blood creatinine	
	Abs	%	Abs	%	Abs	%
2 stage (n=12)	11	91,7	9	75	-	
3 stage (n=66)	42	63,6	50	75,7	8	12,1
4 stage (n=51)	18	35,3	35	68,6	14	27,4
5 stage (n=17)	5	29,4	11	64,7	3	17,6
Total	76	52,1	105	72	25	17,1

CONCLUSIONS

The results of blood and urine tests after seven days of treatment with pentoxifylline in 52.1% of cases showed the decrease in serum creatinine level, and in 72% - reduction of proteinuria. The initial level of proteinuria was on average 1.7 g/l and after treatment with pentoxifylline decreased to 0.82 g/l.
It should be noted that the effectiveness of pentoxifylline depended on the stage of CKD. So the best effect was observed after treatment in patients with CKD stages 2 and 3 (91.7% efficiency and 63.6%, respectively). Efficacy of pentoxifylline in patients with stage 4-5 does not exceed 35%. Moreover, in 27% of patients had the opposite effect - increase in serum creatinine level, although subjective deterioration of condition were not observed.
Statistical analysis showed that the risk of negative outcome of pentoxifylline in patients with stage 4 (OR =3.2; 95%CI 1.49-6.9; p=0.02) and stage 5 (OR =4.2; 95%CI 1.3-13; p=0.01) is significantly higher comparing with patients with stage 3.
Thus, pentoxifylline may be used in combination with other drugs to enhance the renoprotective effect at patients with CKD 2 and 3 stages. It is not recommended to use at patients with 4 and 5 stages of CKD because of opposite effect.

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