

## **Plaferon Application in Patients with Urolithiasis of Only Kidney**

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### **Abstract**

Has been studied influence of plaferon on stimulation of restoration of renal functions in patients with only kidney urolithiasis. Total of 42 patients with urolithiasis of only kidney (control group - 23, and group, where plaferon was used - 19 patients) has been investigated. In the group where patients were subjected to plaferon injections, the creatinine clearance by the second week after operative intervention was increased ( $50 \pm 41$  ml/min) and reached statistically reliable difference compared to control data ( $38,3 \pm 4,2$  ml/min;  $p < 0,05$ ). There was detected correlation between data of mean reabsorption of "osmotically free" water in each nephron and mass of functioning nephrons. This correlation in control group was expressed slightly and could not be assessed as positive. In both groups we did not determine correlation between excretive fraction of filtrated sodium and reabsorption of "osmotically free" water. Plaferon contributes to stimulation of restoration of renal function in patients with urolithiasis of only kidney after operative intervention and restoration of urine passage. Plaferon application in postoperative period revealed improvement of glomerular filtration and investigated parameters compared to control group. Plaferon should be used in patients with urolithiasis of only kidney with the purpose of stimulation of restoration of its function during postoperative period.

**Keywords:** *urolithiasis, only kidney, renal function, plaferon*

### **Introduction**

The functional state of only kidney, being left after nephrectomy, is the topical question and problem in modern urology.

Urolithiasis heads the list in urologic diseases of only kidney, and its treatment still remains quite difficult and in most cases unsolved task.

The main threat is postoperative complications related to functional insufficiency of only kidney.

Considering aforesaid circumstances, using of medical remedy acquires great importance, which could preserve kidney from ischemic alteration during operative intervention and contribute to stimulation of restoration of only kidney in postoperative period.

Total of 42 patients with only kidney urolithiasis (control group - 23; the group where plaferon was used - 19 patients) has been studied. Female - 23, male - 19.

According to age patients were distributed as following: under 30 years - 2 patients (5,3%); from 31 to 40 years - 22 (26,3%); from 41 to 50 years - 20 (47,4%); from 51 to 60 years - 9 patients (21%).

According to duration of urolithiasis of only kidney the following groups were formed: from 1 to 2 years - 4 patients (10,5%); from 2 to 4 years - 12 (26,3%); from 4 to 6 years - 22 (52,7%) and above 6 years - 4 patients (10,5%).

In all patients urolithiasis of only kidney was detected after extirpation of contralateral kidney as a meter of renal stones with developed hydronephrosis (37 patients) and pnonephrosis of kidney (5 patients).

### **Material and Methods**

The main symptom of investigated patients was pain, expressed by a renal colic (18 patients, 42,1%) and permanent dull pain (24 patients, 57,9%).

In majority of patients renal colic was accompanied by increased body temperature (63,1%).

Macrohematuria was marked in 5 patients (26,3%). In majority of patients pyuria was manifested.

Hypo- and isosthenuria were identified in all patients. The urine reaction was acidic in 68,4% of cases and alkaline in 31,6% of cases.

Bacteriologic investigation of urine in majority of cases has shown *Escherichia coli* (42,2%) and *Proteus vulgaris* (21,0%).

The self-removal of renal stones was detected in 26,3% of patients. Repetitive self-removal of stones, more than one, was revealed in 2 patients.

During echography and X-ray examinations the single stones pelvis was discovered in 13 patients (31,6%), the multiple stones pelvis - in 24 patients (57,9%) and 5 patients were with coral like stones (10,5%).

Azotemia above 35 mc.mol/l was observed in 47,4% of patients; from 34 to 40 mc.mol/l - in 36,8% and above 40 mc.mol/l - in 15,8% of patients.

The plasma creatinine concentration from 1,5 to 1,8 was detected in 2,3% of cases, from 1,8 to 2,5 - in 52,6% of cases and above 2,5 - in 21,1% of cases.

Immediate cause of azotemia (86,0%) was disordered passage of urine and exacerbation of suppurative process in kidney.

Plaferon was injected intramuscularly during 10 days with the dose of 40 mg, three times a day, (19 patients).

Have been investigated the main parameters of functional state of kidneys (clearance of creatinine, osmotically active substances, sodium, its excretive fractions, reabsorptive and excretive fractions of water). Measurements were carried out on 7th and 14th days after operative intervention.

The operative investigation involved pyelolithotomy (18 patients), pyelolithotomy with nephrolithotomy (12 patients), ureterolithotomy (2 patients).

## **Results**

Analysis of renal functional state indices has shown that the mean creatinine clearance was  $31,5 \pm 4,7$  ml/min,

with quite sharp disorders of renal osmoregulatory, water-excretory and electrolyte-excretory functions.

It appeared, that in the group where patients were subjected to plaferon injections, the creatinine clearance by the second week after operative intervention was increased (*Tab.1*) reaching statistically significant difference compared to control data.

Creatinine clearance does not reach 50 ml/min (in control group  $38,3 \pm 4,2$  ml/min), or the mass of functioning nephrons constitutes for about 45-50%. However, we have to take into consideration that in control group, compared to initial data and indices, the mentioned augmentation is quite essential.

Results after analysis of ratio of mean reabsorptive state of "osmotically free" water in each nephron and mass of functioning nephrons appeared expressive. There was detected correlation between these indices. In control group above-mentioned interrelations are expressed slightly and could not be assessed as positive.

Increase in mass of functioning nephrons is accompanied by the increased reabsorption of "osmotically free" water. However, it should be mentioned, that during the period of investigations we did not determine connection between the excretive fraction of filtered sodium and reabsorption of "osmotically free" water.

Noteworthy, that in investigated subgroup the specific gravity of urine after renal relieve on the background of polyuria still has tendency toward increase and constitutes for about 1012. In control group it does not exceed 1010. The given tendency becomes clear if consider the dynamics of changes in clearance of osmotically active substances and reabsorptive fraction of "osmotically free" water.

It is supposed, that disorders in excretion of "osmotically free" water mainly were determined by the increased delivery of fluid in distal portion of nephron and not by the urine's osmotic concentration function disorder.

## **Conclusion**

Plaferon contributes to stimulation of restoration of renal function in patients with urolithiasis of only kidney after operative treatment and restoration of urinary passage. In case of plaferon administration during postoperative period, improvement of glomerular filtration and other investigated parameters has been detected compared to control group.

Plaferon should be used in patients with urolithiasis of only kidney with the purpose of stimulation of restoration of its function in postoperative period.

INVESTIGATED PARAMETERS AND UNITS	THE MEAN VALUE OF INVESTIGATED PARAMETERS BEFORE OPERATION	TIME AFTER RENAL RELIEVE			
		Investigative group		Control group	
		7 <sup>th</sup> day	14 <sup>th</sup> day	7 <sup>th</sup> day	14 <sup>th</sup> day
Creatinine clearance (ml/min)	31,5±,7	39,8±6,2	58,1±5,9 P <sub>1</sub> <0,05 P <sub>2</sub> <0,05	35,1±6,1	40,1±4,2
Clearance of osmotically active substances (%)	5,8±0,7	5,0±0,95	4,7±0,8	5,6±0,3	5,1±0,7
Excretive fraction of osmotically active substances (%)	5.2 ±0,4	4,95±0,7	4,5±0,63	5,05±0,9	4,8±0,03
Sodium clearance (ml/min)	0,3±0,05	0,35±0,07	0,4± 0,09	0,35±0,04	0,37±0,06
Excretive function of sodium (%)	0.66±0,08	0,6±0,05	0,54± 0,08	0,62±0,07	0,59±0,06
Excretive fraction of water (%)	0,32±0,07	0,4±0,056	0,42±0,1	0,36±0,05	0,39±0,08
Reabsorptive fraction of water (%)	2,3±0,1	2,8±0,07	3,4±0,15	2,6±0,07	3,0±0,09

P1-Statistical significance towards initial data.  
 P2-Statistical significance towards control data.

**Tab.1** *The mean indices of investigated parameters of renal functions during postoperative period.*

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## **Применение плаферона у больных с мочекаменной болезнью единственной почки**

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### **Р Е З Ю М Е**

Изучено влияние плаферона на стимуляцию восстановления функции почки у пациентах с мочекаменной болезнью единственной почки. Исследовано 42 пациента с МКБ единственной почки (контрольная группа -23; группа, где использовался плаферон- 19 пациентов). В группе больных, где производилось введение плаферона, клиренс креатинина ко второй неделе после оперативного вмешательства увеличился (50 мл/мин) достигнув статистически значимого различия по сравнению с контрольными данными ( $38,3 \pm 4,2$  мл/мин;  $P < 0,05$ ). Между показателями реабсорбции "осмотически свободной" воды в среднем в каждом нефроне и массой действующих нефронов выявилась корреляция. В контрольной группе эти взаимоотношения выражены слабо и не могут быть оценены как положительные. В обеих группах мы не определили связи между экскретируемой фракцией профильтрованного натрия и реабсорбцией "осмотически свободной" воды. Плаферон способствует стимулированию восстановления функции почки у больных с МКБ единственной почки после оперативного лечения и восстановления пассажа мочи. При применении препарата в послеоперационном периоде отмечается улучшение клубочковой фильтрации и других исследуемых параметров по сравнению с контрольной группой. Плаферон следует применять у больных с мочекаменной болезнью единственной почки с целью стимуляции восстановления ее функции в послеоперационном периоде.

**Ключевые слова:** мочекаменная болезнь единственной почки, функция почки, плаферон