HIGHER RESIDUAL URINE VOLUME MEANS BETTER SURVIVAL IN PERITONEAL DIALYSIS PATIENTS

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Objectives:

Residual renal function (RRF) has been shown to play an important role in volume control and survival in patients with end stage renal disease (ESRD). However, patients with RRF tended to be assigned to PD, because RRF ca be preserved better in PD. We aimed to test the survival advantage of baseline RRF in our cohort of patients with peritoneal dialysis (PD).

Methods:

Two hundred and two patients who were treated with PD between 1997 and 2012 were reviewed retrospectively. Patients who had been undergoing PD treatment for at least 6 months and age ≥ 18 years were selected. The patients were divided into two groups at the beginning of PD therapy according to their urine output; patients with ≤ 100 ml/day urine output were regarded as RRF (-) group, while those who had >100 ml/day urine were regarded as RRF (+) group. Demographic, clinical, biochemical parameters, total Kt/V levels, peritonitis incidence, patient survival and causes of death were compared between these two groups.

Table 1. The demographic features and laboratory findings of the patients at the beginning of the PD therapy.

	RRF (-) (n:72)	RRF (+) (n:130)	p
Age (y)	43.5±14.7	43.5±14.5	NS
Gender (F/M)	46/26	60/70	0.019
Dry weight (kg)	60.7±15.8	64.5±14.1	NS
BMI (kg/m²)	23.5±5.4	23.6±4.3	NS
Follow-up time (month)	46.7±32.9	38.2±26.1	0.046
Duration on HD (month)	0.46±0.05	0.47±0.06	NS
Diabetes mellitus (n. %)	7 (%9.7)	24 (%16,9)	NS
Residual volume (ml/day)	32.9±78.7	639.0±438.5	0.001
Creatinine clearance (ml/min)	57.7±14.5	63.8±18.1	0.034
Kt/V	2.21±0.44	2.20±0.61	NS
Ultrafiltration (ml/day)	1075.3±417.4	982.5±457.5	NS
Serum hemoglobin (g/dl)	10.8±2.5	10.7±1.5	NS
Serum albumin (g/dl)	3.7±0.5	3.6±0.6	NS
Serum calcium (mg/dl)	9.3±0.9	9.0±0.9	0.011
Serum phosporus (mg/dl)	4.9±1.6	5.1±1.6	NS
Serum intact PTH (pg/ml)	329.9±358	334.6±366.4	NS
Serum Ferritin (ng/ml)	660.9±647.7	327.3±274.7	0.001
Serum bicarbonate (mEq/L)	25±3.6	25.5±3.5	NS
Serum CRP (mg/L)	19.6±28.9	19.7±30.8	NS

Table 2. Mortality rates and etiologies of the groups.

	RRF (-) (n:72)	RRF (+) (n:130)	p
Exitus (n)	15	11	0.012
Peritonitis	4	4	NS
Other infections	1	0	NS
Cardiac	2	1	NS
Pulmonary embolism	1	0	NS
Malnutrition	1	1	NS
Inadequate dialysis	2	0	NS
Unknown	4	5	NS

Table 3. Factors correlates with residual renal volume at the beginning of the PD therapy.

	p	r
Dry weight (kg)	**0.005**	**+0.197**
Duration on HD (month)	**0.001**	**-0.336**
CRP (mg/L)	**0.011**	**-0.222**
Ferritin (ng/ml)	**0.001**	**-0.347**
Creatinine clearance (ml/min)	**0.021**	**+0.186**
Exitus (n)	**0.048**	**-0.139**

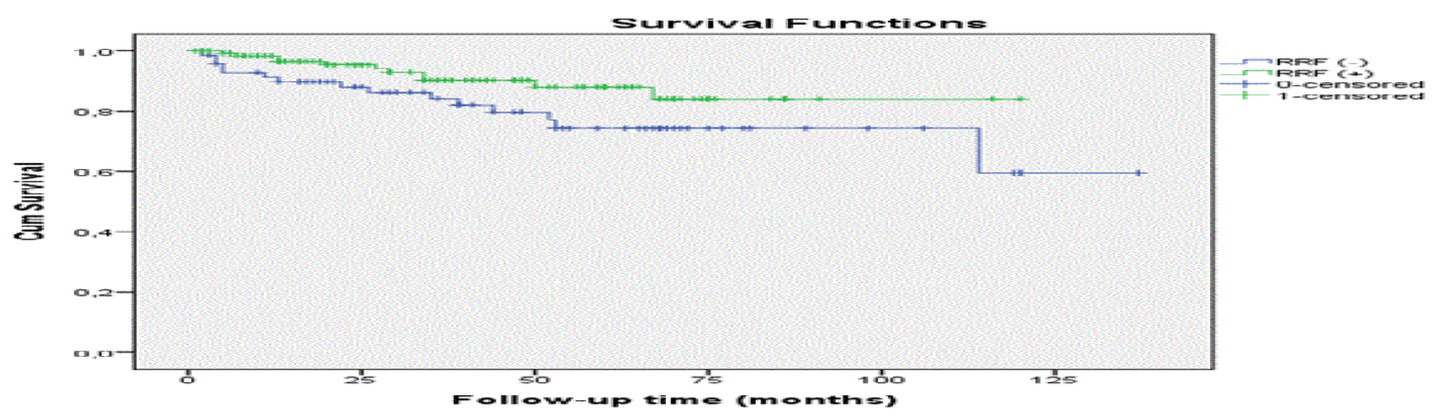
Table 4. Patient survival time according to residual renal functions at the beginning of the PD therapy.

	n	Exitus (n)	Mean patient survival (month)	%95 CI		1 year survival	2 year survival	5 year survival	p
				Lower	Upper				
RRF(-)	72	15	105.3±7.0	91.5	119.1	%91.3	%88.0	%74.4	0.05
RRF(+)	130	11	106.7±3.8	99.1	114.3	%96.5	%95.4	%90.2	

Table 5. Multivariate logistic regression analysis of the factors that predicts mortality at the beginning of the PD therapy.

	p	ODDS	% 95 CI	
			Lower	Upper
Advanced age (y)	0.017	1.074	1.013	1.140
Low serum albumin (g/dl)	0.048	0.235	0.056	0.986
High serum CRP (mg/L)	0.001	1.041	1.016	1.067
Low serum hemoglobin (g/dl)	0.011	2.124	1.189	3.794
Low Kt/V	0.013	0.061	0.007	0.559

Figure 1. Paticnt survival functions of RRF groups.



Results:

Data of 202 patients were available to review; 72 (35.6%) patients had no-RRF (46 female, mean age 43.5 14.7 years, mean duration of hemodialysis before PD 0.46 0.05 months), while 130 (64.5%) patients had RRF (60 female, mean age 43.5 14.5 years, mean urine volume 639.0 438.5mL/day, mean duration of hemodialysis before PD 0.47 0.06 months). Mean follow time was 41.2 28.9 months. Mean survival rates of patients with versus without RRF at 1, 3, and 5 years were 96.5% vs 91.3% (p = 0.05), 95.4% vs 88.0% (p = 0.05), and 90.2% vs 74.4% (p = 0.05), respectively. Peritonitis was slightly, but insignificantly more common in patients without RRF (1.88 2.5 vs 1.48 1.8) and the most common cause of death in both groups (no-RRF 26.6% vs RRF 36.3%). Two patients died due to dialysis insufficiency among those without RRF, while non in the other group. Urine volume at the beginning of PD was correlated negatively with mortality (r = -0.245; p = 0.05) and positively with total creatinine clearance (r = +0.259; p = 0.039).

Conclusions:

PD patients with residual renal function have a survival advantage both early and late in the course of treatment. The advantage in rates of peritonitis did not reach a statistical significance due to low event rate. Higher urine volume may be an indicator of a higher glomerular creatinine clearance, which translates into lower mortality.

References:

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