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Explorations of the correlation of initial peritoneal function test on the prognosis of peritoneal dialysis patients

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Objectives : Peritoneal dialysis (PD) patients exhibiting a heightened peritoneal membrane transport status tend to endure less favorable clinical outcomes in comparison to their counterparts with a lower peritoneal transport status. This study aims to ascertain the interrelation between peritoneal membrane transport status and chosen PD modality concerning the clinical outcomes of recently initiated PD patients.
Methods : A retrospective cohort analysis was conducted, encompassing 359 incident PD patients enrolled between 2016 and 2020, with a follow-up period extending until December 2022. Patients were categorized based on their initial peritoneal membrane transport status and their selected PD modality. Clinical parameters, encompassing age, gender, and demographics, were meticulously documented. Cox regression models were employed for the primary outcomes analysis, which encompassed mortality, technique failure and peritonitis.
Results : All incident PD patients were divided into four groups: 72 patients in the H-HA_APD group, 93 patients in the H-HA_CAPD group, 63 patients in the L-LA_APD group, and 131 patients in the L-LA_CAPD group. The L-LA_APD group had a statistically lower rate of peritonitis compared to the H-HA group (24% vs. 42%, $p < 0.041$), while both groups had the same drop-out rate (32% vs. 32%). Multivariate analysis revealed that age and CRP were independent factors affecting technique failure and mortality rates. Age was predictors of the time to the first occurrence of peritonitis.
Conclusions : Individuals characterized by a high peritoneal membrane transport status experienced notably elevated mortality and peritonitis rates. However, it is imperative to underscore that age, rather than the initial peritoneal membrane transport status, could emerge as the pivotal predictive factor influencing the clinical outcomes of newly initiated PD patients.

PET Table1.jpg

Table 1. Baseline characteristics and outcomes distribution of all patients.

	H-HA_APD	H-HA_CAPD	L-LA_APD	L-LA_CAPD	
	N=72	N=93	N=63	N=131	*P* value
Age	54 (42,66)	61 (51,74)	51 (40, 63)	56 (44,68)	**<0.001**
Male gender	41 (57%)	51 (55%)	39 (62%)	66 (50%)	0.5
Smoking	5 (6.9%)	10 (11%)	5 (7.9%)	9 (6.9%)	0.6
Hemoglobin	9.40 (8.70, 10.03)	9.50 (8.80, 10.30)	9.80 (9.00, 10.40)	10.00 (9.10, 10.75)	**0.016**
CRP	0.19 (0.06, 0.66)	0.27 (0.10, 0.83)	0.15 (0.05, 0.70)	0.18 (0.07, 0.42)	0.13
Total Kt/V	1.93 (1.76, 2.16)	1.97 (1.80, 2.15)	1.91 (1.81, 2.18)	1.98 (1.82, 2.22)	0.6
Total Ccr	66 (55, 85)	73 (59, 88)	67 (54, 84)	74 (57, 94)	0.2
nPCR	1.03 (0.9, 1.23)	0.99 (0.88, 1.16)	1.06 (0.88, 1.21)	1.08 (0.94, 1.23)	0.2
Peritonitis	30 (42%)	31 (33%)	15 (24%)	32 (24%)	**0.041**
Time to first peritonitis	3.20 (2.40, 4.63)	3.70 (2.70, 5.4)	3.70 (2.40, 5.20)	3.60 (2.65, 4.80)	0.4
Hospitalization	2.00 (0.00, 4.00)	2.00 (1.00, 3.00)	1.00 (0.00, 2.50)	1.00 (0.00, 3.00)	0.2
Technique failure	23 (32%)	50 (54%)	20 (32%)	44 (34%)	**0.005**
Time to technique failure	3.55 (2.68, 4.70)	3.40 (2.10, 4.50)	3.20 (2.30, 4.90)	3.50 (2.40, 4.65)	0.7

Abbreviation: H-HA, high to high average; APD, automated peritoneal dialysis; CAPD, continuous ambulatory peritoneal dialysis; L-LA, low to low average; CRP, C-reactive protein; Ccr, creatinine clearance; nPCR, normalized protein catabolic rate; IQR, interquartile range; n, number
Median (IQR); n (%)

PET Table1.jpg

Table 2. Predictors of peritonitis in PD patients.

	Univariate			Multivariate		
	HR	95% CI	*P* value	HR	95% CI	*P* value
Age	1.01	1.00, 1.03	**0.025**	1.01	1.00, 1.03	**0.044**
Female	0.95	0.65, 1.40	0.80	1.09	0.72, 1.64	0.70
Smoking	1.39	0.72, 2.67	0.51	1.60	0.77, 3.30	0.38
Hemoglobin	0.99	0.86, 1.14	0.91	1.02	0.87, 1.19	0.83
CRP	1.00	0.94, 1.07	0.99	0.99	0.91, 1.07	0.71
Albumin	0.68	0.47, 0.98	**0.039**	0.83	0.52, 1.31	0.43
Total Kt/V	1.19	0.67, 2.11	0.55	0.87	0.46, 1.62	0.65
Type			0.052			0.17
H-HA_APD	-	-		-	-	
H-HA_CAPD	0.72	0.43, 1.18		0.64	0.37, 1.10	
L-LA_APD	0.51	0.28, 0.95		0.64	0.34, 1.21	
L-LA_CAPD	0.52	0.32, 0.86		0.54		

Abbreviation: H-HA, high to high average; APD, automated peritoneal dialysis; CAPD, continuous ambulatory peritoneal dialysis; L-LA, low to low average; CRP, C-reactive protein; Ccr, creatinine clearance; HR, hazard ratio; CI, confidence interval.