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Era-Dependent Association Between High Peritoneal Transport Status and Technique Failure in Peritoneal Dialysis

Ho-Joong Yoon¹, Sion Lee², Ji-Hwan Kim¹, Sung-Gyun Kim¹, Jwa-Kyung Kim¹¹Department of Internal Medicine-Nephrology, Hallym University Sacred Heart Hospital, Korea, Republic of²Department of Department of Statistics and Institute of Statistics, Hallym University, Chuncheon, Korea, Republic of

Objectives : High peritoneal transport status has traditionally been linked to adverse outcomes in peritoneal dialysis (PD). However, its clinical relevance in contemporary, individualized PD practice remains unclear. We therefore evaluated its association with technique failure across successive treatment eras.

Methods : We conducted a retrospective cohort study of 473 incident PD patients between 2000 and 2023. Baseline peritoneal transport status was determined by the 4-hour dialysate-to-plasma creatinine ratio and categorized as high or non-high. Patients were grouped into three treatment eras reflecting major changes in PD practice. The primary outcome was technique failure, with death and transplantation treated as competing events. Fine-Gray models were used to evaluate associations, including interaction terms between transport status and era.

Results : Among the study population, 114 patients (24.1%) were classified as high transporters. In the earliest era, high transport status was associated with nearly twofold higher crude technique failure rates compared with non-high status, whereas this difference largely disappeared in the most recent era. In fully adjusted competing-risk models, high transport status was not independently associated with technique failure, whereas later treatment era and higher serum albumin were protective, and older age increased risk. A significant interaction between transport status and era ($p = 0.044$) demonstrated attenuation of its prognostic impact in contemporary practice.

Conclusions : The clinical significance of high peritoneal transport status appears to be era-dependent and has diminished with the evolution of modern PD care. PET-derived transport characteristics function primarily as tools to guide individualized prescription rather than fixed predictors of outcome.

Table 3.JPG

Table 3 Crude clinical outcomes and technique failure rates according to transport status across PD eras^{a,†}

Era ^{a,‡}	Transporter ^{a,‡}	N ^{a,‡}	Follow-up duration (months)* ^{a,‡}	Technical Failure, ^{a,‡} n (%) ^{a,‡}	Death, ^{a,‡} n (%) ^{a,‡}	Transplant, ^{a,‡} n (%) ^{a,‡}	Technical failure rate ^{a,‡} (per 100PYs) ^{a,‡}
Era 1 (2000–2007) ^{a,‡}	High ^{a,‡}	23 ^{a,‡}	26.5 (9.1–48.9) ^{a,‡}	12 (52.2) ^{a,‡}	7 (30.4) ^{a,‡}	2 (8.7) ^{a,‡}	18.6 ^{a,‡}
	Non-High ^{a,‡}	78 ^{a,‡}	33.1 (17.3–76.1) ^{a,‡}	32 (41.0) ^{a,‡}	19 (24.4) ^{a,‡}	16 (20.5) ^{a,‡}	9.1 ^{a,‡}
Era 2 (2008–2015) ^{a,‡}	High ^{a,‡}	37 ^{a,‡}	31.0 (10.8–61.4) ^{a,‡}	14 (37.8) ^{a,‡}	14 (37.8) ^{a,‡}	4 (10.8) ^{a,‡}	9.4 ^{a,‡}
	Non-High ^{a,‡}	118 ^{a,‡}	42.2 (17.3–73.2) ^{a,‡}	40 (33.9) ^{a,‡}	20 (16.9) ^{a,‡}	30 (25.4) ^{a,‡}	7.8 ^{a,‡}
Era 3 (2016–2023) ^{a,‡}	High ^{a,‡}	54 ^{a,‡}	28.6 (16.9–46.3) ^{a,‡}	10 (18.5) ^{a,‡}	9 (16.7) ^{a,‡}	7 (13.0) ^{a,‡}	6.7 ^{a,‡}
	Non-High ^{a,‡}	163 ^{a,‡}	37.2 (23.9–60.6) ^{a,‡}	32 (19.6) ^{a,‡}	13 (8.0) ^{a,‡}	28 (20.0) ^{a,‡}	5.4 ^{a,‡}

^a follow-up duration is presented as median (interquartile range). Technique failure was defined as permanent transfer to hemodialysis.^{a,†}Technique failure rates were calculated as events per 100 patient-years of follow-up. Death and kidney transplantation were treated as competing events in subsequent analyses.^{a,†}



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