

**Abstract Type : Oral presentation****Abstract Submission No.: A-0300****Abstract Topic : Dialysis**

Serum Alkaline Phosphatase and Peritoneal Dialysis Discontinuation: A Prospective Cohort Study

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Objectives : Serum alkaline phosphatase (ALP) is a routinely measured biomarker associated with adverse outcomes in chronic kidney disease. However, evidence in peritoneal dialysis (PD) is limited, and the association between ALP and technique failure, a core PD outcome, has not been investigated. We aimed to evaluate the association between serum ALP levels and the risk of technique failure and the composite outcome in a prospective cohort of PD patients.

Methods : A total of 501 incident and prevalent PD patients were enrolled in the KoreaN Cohort Study for Outcomes in Patients with Peritoneal Dialysis (KNOW-PD). Baseline serum ALP was analyzed as both a continuous (log-transformed) and categorical variable based on the upper limit of normal (ULN). The primary outcome was technique failure, and the secondary outcome was a composite of technique failure and all-cause mortality. Cox proportional hazards models stratified by PD vintage were applied to estimate hazard ratios (HRs) with multivariable adjustment.

Results : During a median follow-up of 2.95 years, technique failure occurred in 159 patients (32%), and the composite outcome occurred in 184 patients (37%). Higher log-transformed ALP was associated with increased risks of technique failure and the composite outcome (adjusted hazard ratio [aHR], 2.07; 95% CI, 1.27–3.35 and aHR, 1.99; 95% CI, 1.25–3.17, respectively). In categorical analyses, patients with serum ALP levels $\geq 1.0 \times \text{ULN}$ had significantly higher risks of technique failure and the composite outcome compared with those with serum ALP $< 0.5 \times \text{ULN}$ (aHR, 2.00; 95% CI, 1.02–3.93 and aHR, 2.09; 95% CI, 1.10–3.96, respectively).

Conclusions : Elevated serum ALP levels were independently associated with an increased risk of technique failure and composite outcomes in patients undergoing PD. These findings suggest that serum ALP may serve as a valuable prognostic marker for adverse PD outcomes, beyond its traditional role in CKD–MBD.

Table1.JPG

Table 1. Associations of Continuous Log-transformed ALP With Technique Failure and Composite Outcome

log (ALP)	Model 1 ^a		Model 2 ^b		Model 3 ^c	
	HR (95% CI)	P-value	HR (95% CI)	P-value	HR (95% CI)	P-value
Technique failure						
log (ALP)	1.41 (1.03, 1.95)	0.035	1.48 (1.05, 2.07)	0.025	2.07 (1.27, 3.35)	0.003
Composite outcome						
log (ALP)	1.45 (1.08, 1.96)	0.014	1.53 (1.11, 2.10)	0.009	1.99 (1.25, 3.17)	0.004

ALP, alkaline phosphatase; HR, hazard ratio; CI, confidence interval.
All models were stratified by dialysis vintage (incident vs prevalent).^aModel 1 was unadjusted.^bModel 2 was adjusted for age and sex.^cModel 3 was adjusted for age, sex, peritoneal dialysis modality, diabetes mellitus, hypertension, cardiovascular/cerebrovascular disease, residual urine volume, serum phosphate, calcium, parathyroid hormone, albumin, hemoglobin, and medication use (calcium-based phosphate binders, non-calcium-based phosphate binders, vitamin D or its analogues, and calcimimetics).

Table1.JPG



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

KSN SEOUL, KOREA
2026

The 46th Annual Meeting of the Korean Society of Nephrology



Jun 11 (Thu) – 14 (Sun), 2026

COEX, Seoul, Korea

Figure 1. Restricted cubic spline curves plotting the association between serum alkaline phosphatase (ALP) levels and the risk of technique failure and the composite outcome

