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Plasma Presepsin as a Predictor of Mortality in Patients with Sepsis Due to Urinary Tract Infection

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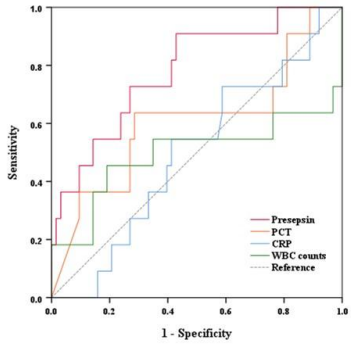
Objectives : Presepsin has recently been recognized as a reliable sepsis biomarker; however, its predictive value for mortality in patients with urinary tract infection (UTI) sepsis is unclear. This study aimed to evaluate whether plasma presepsin levels are a more reliable predictor of mortality than traditional infection biomarkers in patients with UTI sepsis.
Methods : This single-center retrospective study evaluated 44 patients with UTI sepsis who were admitted to the emergency department between May 2022 and August 2023. Data on vital signs, plasma presepsin, procalcitonin (PCT), C-reactive protein (CRP) levels, white blood cell (WBC) count, and other laboratory values at admission were also collected. The values of presepsin, PCT, CRP, and WBC count for predicting 28-day mortality were analyzed. Survivors and nonsurvivors were propensity score-matched in a 1:2 ratio based on age, sex, and estimated glomerular filtration rate.
Results : In the overall cohort, presepsin showed the highest area under the receiver operating characteristic (ROC) curve (AUROC) of 0.793 for predicting 28-day mortality, surpassing that of PCT (0.647), CRP (0.616), and WBC count (0.386). High presepsin levels (>1310 pg/mL) were independently associated with an increased risk of 28-day mortality (hazard ratio, 5.438; P=0.019). In the propensity score-matched cohort, the presepsin levels also showed the highest AUROC (0.740), followed by PCT (0.643), CRP (0.636), and WBC count (0.364). High presepsin levels (>825 pg/mL) were independently associated with an increased risk of 28-day mortality.
Conclusions : Plasma presepsin levels are significantly associated with mortality and may be valuable biomarker for identifying high-risk patients with UTI sepsis.

presepsin figure1 for KSN.jpg

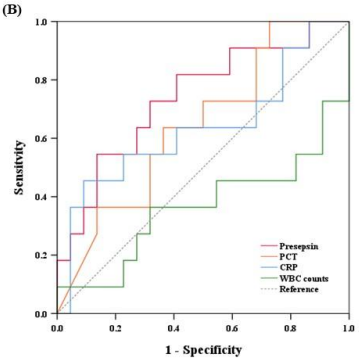
Figure 1

(A)



	AuROC value	Cutoff	Sensitivity	Specificity
Presepsin	0.793	1310	0.727	0.788
PCT	0.647	15.5	0.636	0.667
CRP	0.616	16.6	0.545	0.818
WBC counts	0.386	16.0×10^3	0.364	0.727

(B)



	AuROC value	Cutoff	Sensitivity	Specificity
Presepsin	0.740	825	0.818	0.591
PCT	0.643	12.2	0.636	0.636
CRP	0.636	21.7	0.455	0.909
WBC counts	0.364	28.7×10^3	0.091	1.000

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Table 2. Multivariate Cox regression analysis for 28-day mortality

Variable	Univariate analysis			Multivariate analysis		
	p-value	HR	95% CI	*p*-value	HR	95% CI
Sex (Ref. Male)	0.185	2.819	0.608–13.074	0.080	4.640	0.834–25.834
Age (per 1 year)	0.903	1.004	0.941–1.071	-	-	-
WBC count (Ref. < 16.0×10^3/μL)	0.534	1.477	0.432–5.052	-	-	-
CRP (Ref. < 16.6 mg/dL)	0.037*	3.537	1.078–11.605	-	-	-
PCT (Ref. < 15.5 ng/mL)	0.090	2.893	0.846–9.891	-	-	-
Lactate (per 1 mmol/L)	0.773	1.031	0.838–1.269			
Arterial pH (per 0.1)	0.002*	0.328	0.160–0.673	0.028*	0.374	0.155–0.901
eGFR (per 1 ml/min/1.73m^2)	0.182	0.985	0.963–1.007	-	-	-
DM (Ref. No)	0.142	2.435	0.742–7.990			
Presepsin (Ref. < 1310 pg/mL)	0.002*	8.026	2.099–30.686	0.019*	5.438	1.320–22.403

Multivariate regression model was adjusted for known significant factors and those that showed statistical differences between the survivor and non-survivor groups. All participants (100%) were included in the regression model. The following parameters were used: sex, age, high WBC counts, high CRP, high PCT, arterial pH, eGFR and high presepsin. *indicates a *p*-value < 0.05. AKI, acute kidney injury; CI, confidence interval; CKD, chronic kidney disease; CRP, C-reactive protein; DM, diabetes mellitus; eGFR, estimated glomerular filtration rate; HR, hazard ratio; PCT, procalcitonin; WBC, white blood cell.