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ORIGINAL ARTICLE

Soluble Thrombomodulin can Predict In-Hospital Mortality of Community-Acquired Pneumonia Patients in Intensive Care Unit

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SUMMARY

Background: **Community-acquired pneumonia (CAP) patients admitted to ICU face high mortality rates, necessitating prognostic biomarkers to risk stratify patients. Soluble thrombomodulin (sTM) is a biomarker of endothelial injury. This retrospective study aimed to investigate sTM's association with disease severity and in-hospital mortality in ICU-admitted CAP patients.**

Methods: **From June 2024 to September 2025, 115 ICU CAP patients in Shanghai Jian District Shibei Hospital were analyzed retrospectively. sTM levels were measured together with other laboratory tests at ICU admission. Demographic data, clinical characteristics, APACHE II scores and laboratory test results were obtained from medical records. The difference between 97 survivors and 18 non-survivors were compared. ROC analysis and multivariable logistic regression were used to evaluate sTM's value in predicting in-hospital mortality. Spearman's correlation and multiple linear regression assessed the association of sTM with other blood biomarkers and APECH II scores.**

Results: **Non-survivors had significantly higher sTM than survivors. sTM correlated with APACHE II scores and disease severity, as well as blood biomarkers of kidney function, inflammation and coagulation. ROC analysis showed that sTM predicted in-hospital mortality with an AUC of 0.747 ($p < 0.001$), higher than that of APACHE II score. The optimal cutoff of sTM was 12.9 TU/mL with sensitivity of 88.9% and specificity of 53.6%. Elevated sTM levels remained independently associated with the risk of in-hospital mortality even after adjusted with APACHE II scores or kidney dysfunction.**

Conclusions: **sTM levels were significantly higher in non-survivors and correlates to APACHE II scores, suggesting its potential as a prognostic biomarker, aiding early risk stratification and tailored ICU management for CAP patients.**

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Supplementary Data

Table S1. AUCs of biomarkers for predicting in-hospital mortality.

Variable	ROC analysis		AUC Compared with sTM	
	AUC	95% CI	Difference between AUC	p
sTM	0.747	0.658 - 0.824	-	-
APACHE II	0.679	0.575 - 0.772	0.068	0.317
CRP	0.657	0.563 - 0.743	0.09	0.249
PCT	0.759	0.665 - 0.837	-0.012	0.825
DD	0.741	0.651 - 0.818	0.006	0.912
LYM	0.756	0.665 - 0.833	-0.009	0.862
ALB	0.693	0.598 - 0.777	0.054	0.513
TBIL	0.690	0.595 - 0.775	0.057	0.534
LDH	0.834	0.751 - 0.898	-0.087	0.288
CREA	0.662	0.566 - 0.749	0.085	0.211
UA	0.728	0.635 - 0.808	0.019	0.824