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EARLY PROTHROMBIN TIME-INTERNATIONAL NORMALIZED RATIO (PT-INR) TRAJECTORIES IDENTIFY DISTINCT COAGULOPATHY PHENOTYPES AND PREDICT MORTALITY IN SEPSIS: A PROSPECTIVE OBSERVATIONAL STUDY

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Introduction. Endothelial dysfunction and coagulopathy are key in sepsis. We assessed whether prothrombin time-international normalized ratio (PT-INR) patterns reveal coagulopathy phenotypes and their association with severity and outcomes.

Materials and Methods. 389 adults with community-acquired sepsis admitted to an IMCU underwent PT-INR measurement at admission and daily for 3 days. PT-INR kinetics variables were used for k-means clustering. Clinical characteristics, 30-day mortality, thrombotic and bleeding events were compared across clusters. Sensitivity analyses excluded oral anticoagulant-treated patients. Multivariable models with bootstrap validation assessed prognostic value, rare events were evaluated using Monte Carlo simulation.

Results. Three PT-INR trajectory phenotypes emerged: Cluster 1 (C1, n=43) with progressive PT-INR worsening; Cluster 2 (C2, n=39) with elevated baseline PT-INR and rapid improvement; and Cluster 3 (C3, n=307) with stable near-normal PT-INR. Severity and comorbidity burden were highest in C1 and C2. 30-day mortality varied across clusters (46.5% in C1, 30.8% in C2, 12.4% in C3; p<0.001). C1 remained an independent mortality predictor after adjustment (OR 4.22, 95% CI 2.01–8.99). Phenotypes persisted in the anticoagulant-free cohort (n=282). Thrombotic events were infrequent, while bleeding risk peaked in C2 during PT-INR normalization.

Conclusions. PT-INR trajectories identify coagulopathy phenotypes in sepsis. Persistent PT-INR worsening predicts mortality, improving and near-normal trajectories show intermediate and lower risks.