

Mortality Risk Prediction Using the SCAI Shock Stages in Patients with Pulmonary Embolism and Cardiogenic Shock

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BACKGROUND

- Early risk stratification in patients with acute pulmonary embolism (PE) is crucial to guide management and prevent complications.
- Normotensive shock has been identified as a prevalent entity in PE patients with high risk of hospital mortality.
- Novel risk stratification scores are emerging to effectively identify high risk patients early.
- The SCAI shock classification system has been shown to effectively risk stratify patients with different etiologies of cardiogenic shock (CS). This classification has not been studied among PE patients with CS.

STUDY

- We identified all patients at 11 hospitals within our health system treated between 2016 and 2022 for CS (ICD-10 R57.0) with a principal diagnosis of PE.
- Patients were divided into hospital survivors and non-survivors and classified according to the Society for Cardiovascular Angiography and Interventions – Cardiogenic Shock Working Group (SCAI-CSWG) criteria as Stages A-E at presentation and as maximum stage achieved during the admission.

DISCLOSURES

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SCAI-CSWG stage classification at admission did not predict mortality risk among patients with PE and CS

Early shock stage presenters had higher mortality risk compared to those presenting with more advanced stages of CS

	All PE with CS (100)	PE CS Survivors (56)	PE CS Non-survivors (44)	P-value
Age	63.9±19	57.7 ±18.8	71.7 ±17	.0002
BMI	30.98±9	30.5±7.9	31.6±10.6	.59
LOS	11.17±10.7	14.4±11.5	7.1±8	.0005
Interhospital Transfer	37% (37)	45% (25)	27% (12)	.07
Cardiac Arrest at Admission	11% (11)	3.5% (2)	20% (9)	.007
ECMO	12% (12)	12.5% (7)	11% (5)	.86
Creatinine	1.6 *9	1.5 *88	1.7 *94	.22
Lactate	6.2 *5	5.1 *4.7	7.6 *5.1	.02
ALT	345.9 *779	396.7 *909	279 *570	.47
HR	95 *26.4	100.5 *21.9	87.9 *29.97	.02
MAP	64.4 *19.5	68.4 *19	59.5 *19.2	.03
SCAI Stage at Presentation				0.3
SCAI Stage A	23% (23)	27% (15)	18% (8)	
SCAI Stage B	11% (11)	11% (6)	11% (5)	
SCAI Stage C	9% (9)	11% (6)	7% (3)	
SCAI Stage D	16% (16)	21% (12)	9% (4)	
SCAI Stage E	41% (41)	30% (17)	55% (24)	

OUTCOMES

- During the study period 100 patients with CS and PE were identified.
- There was a 44% mortality rate.
- Non-survivors were older, had higher rates of cardiac arrest, had higher lactate levels, and lower MAP on admission.
- There was a similar rate of VA-ECMO use among survivors and non-survivors.
- Presenting SCAI stage distribution was similar between survivors and non-survivors.
- Progression to stage C-E was seen in 91% of patients presenting with stage A and 100% of patients presenting with stage B.
- Hospital mortality among patients presenting with stage A and B cardiogenic shock was higher than among patients presenting with SCAI stage C and D.

DISCUSSION

- SCAI-CSWG stage classification at admission did not accurately predict mortality risk among patients with PE and CS.
- Early shock stages had excess mortality risk compared to patients presenting with more advanced stages of shock.
- It is possible that the presence of normotensive shock mediated this observation, and challenges recognizing this cohort led to higher percentage of mortality.

