PULMONARY EMBOLISM RISK STRATIFICATION: the forgotten variables that could make a difference.

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BACKGROUND

Accurate risk stratification in pulmonary embolism (PE) is crucial for guiding management decisions and identifying patients who may benefit from reperfusion therapies. Although validated tools such as PESI and sPESI are commonly used, additional clinical and imaging markers—such as thrombus location (as a surrogate of thrombotic burden), concomitant deep vein thrombosis (DVT), and elevated levels of NT-proBNP and lactate—may offer complementary prognostic information. These variables remain underutilized in routine practice. This study aims to evaluate their prognostic value and their association with ESC/ERS-defined risk categories in a real-world cohort, including patients evaluated by a Pulmonary Embolism Response Team (PERT), to assess their potential role in early risk stratification.

METHODS

A retrospective analysis was conducted on 275 patients with confirmed PE. Risk was categorized as low, intermediate-low, intermediate-high, or high according to ESC/ERS guidelines. Variables analyzed included thrombus location, presence of concomitant DVT, and levels of NT-proBNP and serum lactate. Associations were evaluated using ANOVA and chi-square tests.

RESULTS

Mean age was 64 ± 18 years. Risk distribution was: low (8.4%), intermediate-low (48.4%), intermediate-high (33.7%), and high (10.3%).
The distribution of thrombus location was: segmental (43%), main pulmonary artery (29%), lobar (18%) and subsegmental (7%). Proximal thrombi were significantly associated with higher risk strata ($p < 0.0001$).
Concomitant DVT was present in 25%, absent in 39%, and not assessed in 36%; its presence correlated with higher risk ($p = 0.0001$).
NT-proBNP levels increased across risk categories: low (58 ng/L), intermediate-low (370), intermediate-high (1688), and high (2188) ($p < 0.0001$).
Serum lactate also rose with risk: low (13 mg/dL), intermediate-low (12), intermediate-high (14.6), and high (21) ($p < 0.0001$).

CONCLUSION

Thrombus location, NT-proBNP, lactate, and concomitant DVT were significantly associated with increasing PE risk. These results support the incorporation of these parameters into early PE evaluation and decision-making to optimize outcomes in both routine and high-risk scenarios.

PE Risk Stratification Variables

Risk Stratification	NT -proBNP (ng/L)	Lactate (mg/dL)	Concomitant DVT (%)	Proximal thrombus (%)
LOW	58 IQR: 30-143	13 IQR: 12-15	10	0
INTERMEDIATE-LOW	370 IQR: 143-1459	12 IQR: 9-15	15	30
INTERMEDIATE-HIGH	1688 IQR: 665-7136	14.6 IQR: 11-22	30	70
HIGH	2188 IQR: 624-5686	21 IQR: 14.5-57	50	90

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