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Role of a multidisciplinary pulmonary embolism response team and impact of interventional therapy in the management of patients with intermediate-high risk pulmonary embolism

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Role of a multidisciplinary pulmonary embolism response team and impact of interventional therapy in the management of patients with intermediate-high risk pulmonary embolism

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Background: Despite emerging interventional options for pulmonary embolism (PE), the mortality rate for intermediate high-risk PE (IHR-PE) remains high and the optimal therapeutic approach unclear due to a lack of robust outcomes data. We describe the outcomes of patients presenting with IHR-PE managed by a multidisciplinary PERT program with all available reperfusion options.

Methods: This single center retrospective study included EMR data from patients that were a part of the multidisciplinary PERT program from January 2012 to June 2023. PERT was activated if risk of death was intermediate or higher. The simplified pulmonary embolism severity index (sPESI) and Bova score were used as risk stratification tools. Patients with IHR-PE defined as sPESI > 1, and Bova 5 were analyzed according to therapeutic approach yielding 5 groups: anticoagulation alone (AC), systemic thrombolysis (ST), catheter directed thrombolysis (CDT), percutaneous catheter thrombectomy (PCT) and surgical embolectomy (SE). Patient demographics, ICU length of stay, hospital length of stay, hospital mortality, 30-day mortality, AKI, hemorrhagic CNS events were analyzed. The percentages, median and IQR were reported.

Table 1: Patient Characteristics for intermediate-high risk PERT patients (BOVA 5)

| | |
|--------------------------|-----------------|
| Demographics | Overall (n=112) |
| Age, years, median (IQR) | 59.5 (47-70) |
| Male | 55 (49.1) |
| Past medical history | |
| Diabetes | 18 (16.1) |
| Hypertension | 48 (42.9) |
| Previous CHF | 5 (4.5) |
| Previous CVA | 6 (5.4) |
| CAD | 4 (3.6) |
| Renal failure | 13 (11.6) |
| Risk Factors | |
| Previous DVT/PE | 19 (17.0) |
| Surgery <6 months | 7 (6.3) |

Values are median (IQR) or n (%)

Results: Of the 566 patients with PERT activation during the study timeframe, 112 (20%) were classified as intermediate-high risk (BOVA 5) category. Hospital mortality rate was 3.6%. All

patients that underwent SE and PCT were alive at 30 days, while mortality in AC, ST and CDT groups was 3.9, 4.3, and 7.1% respectively. Patients undergoing PCT had the shortest ICU and hospital length of stay with 0.7 days (0.2-1.2) and 2.8 days (2-6.2). Patients that received ST and CDT had more days in the ICU (1.7; 1.5), hospital length of stay (5.7;4.6 days) and had higher mortality (3.6; 8.3%).

Table 2: Outcomes by initial treatment for intermediate-high risk PERT patients (BOVA 5)

| | AC (n=51) | ST (n=23) | CDT (n=14) | PCT (n=11) | SE (n=13) | Total (n=112) |
|--------------------------|------------------|------------------|------------------|------------------|--------------------|------------------|
| Acute kidney injury (%) | 0.0 | 13.0 | 7.1 | 9.1 | 30.8 | 8.0 |
| CNS hemorrhage event (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Treatment failure (%) | N/A | 13.0 | 0.0 | 18.2 | 0.0 | 4.5 |
| Mortality | | | | | | |
| Hospital (%) | 3.9 | 4.3 | 7.1 | 0.0 | 0.0 | 3.6 |
| 30-Day (%) | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| Length of stay | | | | | | |
| ICU, med. (IQR) | 0.8 (0.0-1.6) | 1.5 (0.9-2.3) | 1.5 (0.9-2.6) | 0.7 (0.2-1.2) | 4.7 (3.0-6.3) | 1.2 (0.4-2.2) |
| Hospital, med. (IQR) | 4.0 (2.8-6.4) | 4.4 (3.2-7.4) | 4.6 (3.7-6.3) | 2.8 (2.1-6.2) | 10.9 (8.2-19.1) | 4.5 (2.9-8.1) |

Conclusion: The coordination of care and management of intermediate-high PE using a multidisciplinary PERT program may improve survival. The emerging role of PCT appears promising by reduction of ICU and hospital length of stay, and mortality. A PERT program with an engaged surgical team supporting is essential for timely rescue of treatment failure or patient decompensation.

Keywords: pulmonary embolism, intermediate-high risk, therapeutic approach.

Disclosures: None