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Where a patient presents predicts reperfusion as well as how ill they are: between-centre variation in the treatment and outcome of intermediate-risk pulmonary embolism in the CORE-PE registry

S. Daub et al., on behalf of the CORE-PE Investigators [author list to be completed]

Background. In intermediate-risk pulmonary embolism (PE), guidelines leave the decision to reperfuse to clinical judgement. We quantified how much that decision varied between hospitals after accounting for patient severity, how much risk-adjusted mortality varied, and whether reperfusion was associated with mortality or harm.

Methods. CORE-PE is a pre-registered multicentre registry (DRKS00034688) of 1,650 patients with CT-confirmed acute PE at 11 German university hospitals (2019–2023), enriched for intermediate-risk presentations. Between-centre variation in receipt of any reperfusion (systemic thrombolysis, catheter-directed therapy or surgical embolectomy) and in in-hospital death was quantified with random-intercept logistic models adjusted for eight severity covariates including the CT right-to-left ventricular (RV/LV) ratio, summarised as median odds ratios (MOR). Within the intermediate-risk stratum the association of reperfusion with death, bleeding and complications was estimated with random-intercept models and inverse-probability weighting, with identification sensitivity analyses.

Results. In-hospital mortality was 7.6% (37.6% high-risk, 5.2% intermediate-high, 4.5% intermediate-low, 0.6% low). Reperfusion of intermediate-high-risk patients ranged from 5% to 98% across centres. After adjustment, the between-centre MOR was 3.42 (95% CI 2.24–7.85) for the reperfusion decision (4.67 within intermediate-high risk) and 1.26 (1.00–1.89) for death; without the single high-volume referral centre, 1.80 and 1.33. Within intermediate-high risk, centre identity discriminated the decision as well as the full severity profile (c-statistic 0.81 vs 0.75; 0.73 vs 0.75 without the referral centre). Among 945 intermediate-risk patients, reperfusion was not associated with lower mortality (random-intercept OR 1.19 (0.49–2.84)); within-centre and landmark estimates ranged from 1.5 to 2.5, all imprecise. Bleeding was more frequent after reperfusion (IPTW OR 3.56 (1.26–10.03)).

Conclusions. In the years before randomised evidence for catheter-directed therapy, where an intermediate-risk PE patient presented predicted whether they were reperfused about as well as how ill they were, without a detectable counterpart in mortality. This variation is the baseline against which the uptake of trial evidence will be measured.

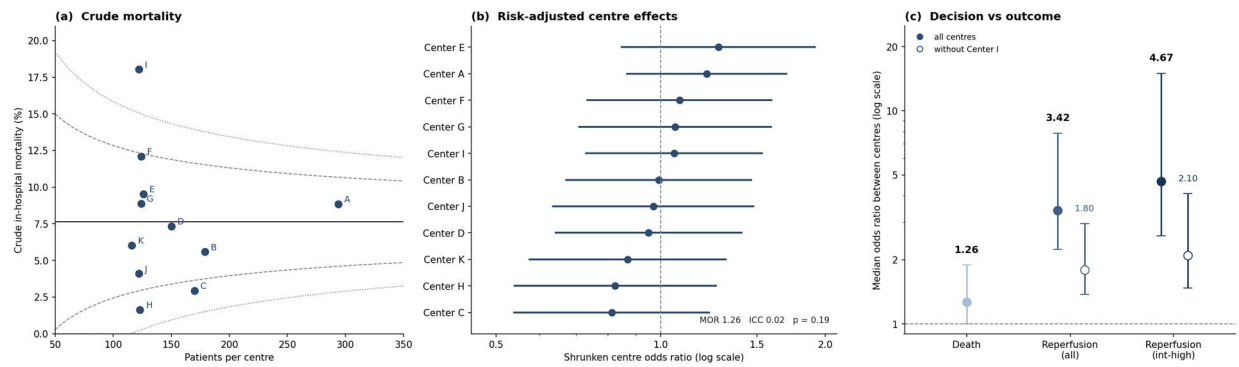


Figure. Between-centre variation in outcome and in the treatment decision. (a) Funnel plot of crude in-hospital mortality by centre. (b) Shrunken centre odds ratios for in-hospital death (random-intercept model). (c) Median odds ratios: between-centre variation in the reperfusion decision (MOR 3.42; 4.67 within intermediate-high risk) exceeds that in death (1.26); open symbols exclude the high-volume referral centre.