

# The Prognostic Value of Renal Function in Acute Pulmonary Embolism—A Multi-Centre Cohort Study

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## Abstract

**Background** Haemodynamic alterations caused by acute pulmonary embolism (PE) may affect multi-organ function including kidneys. This multi-centre, multinational cohort study aimed to validate the prognostic significance of estimated glomerular filtration rate (eGFR) and its potential additive value to the current PE risk assessment algorithms.

**Methods** The post hoc analysis of pooled prospective cohort studies: 2,845 consecutive patients (1,424 M/1,421 F,  $66 \pm 17$  years) with confirmed acute PE and followed up for 180 days. We tested prognostic value of pre-specified eGFR level  $\leq 60$  mL/min/1.73 m<sup>2</sup> calculated on admission according to the Modification of Diet in Renal Disease study equation. The primary outcome was all-cause 30-day mortality; the secondary outcomes were PE-related mortality, 180-day all-cause mortality, bleeding and composite outcome (PE-related death, thrombolysis or embolectomy).

**Results** Two hundred and twenty-three patients (8%; 95% confidence interval [CI]: 7–9%) died within the first 30 days after the diagnosis. The eGFR on admission was significantly lower in non-survivors than in survivors ( $64 \pm 34$  vs.  $75 \pm 3$  mL/min/1.73 m<sup>2</sup>,  $p < 0.0001$ ). Independent predictors for a fatal outcome included: cancer, systolic blood pressure, older age, hypoxia, eGFR, heart rate and coronary artery disease. The eGFR of  $\leq 60$  mL/min/1.73 m<sup>2</sup> independently predicted all-cause mortality (hazard ratio: 2.3; 95% CI: 1.7–3.0,  $p < 0.0001$ ), PE-related outcome and clinically relevant bleedings (odds ratio: 0.90 per 10 mL/min/1.73 m<sup>2</sup>, 95% CI: 0.85–0.95,  $p = 0.0002$ ). The eGFR assessment significantly improved prognostic models proposed by European guidelines with net re-classification improvement of 0.42 ( $p < 0.0001$ ).

## Keywords

- ▶ pulmonary embolism
- ▶ renal dysfunction
- ▶ mortality
- ▶ bleeding
- ▶ prognosis

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