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Synergistic impact of renal failure and left ventricular dysfunction on short- and long-term mortality in patients with STEMI undergoing primary PCI

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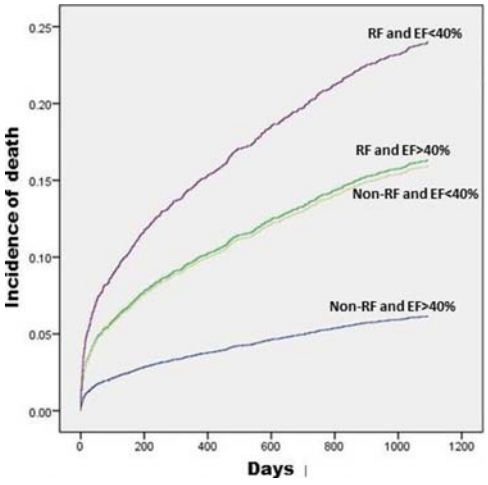
Background: Impaired left ventricular function (LV) and renal failure (RF) have both been separately associated with increased risk of mortality in ST-elevation myocardial infarction (STEMI) undergoing primary percutaneous coronary intervention (PCI).
Purpose: Our aim was to comparatively evaluate the relative impact of LV dysfunction and renal failure (RF) on the risk of mortality in primary PCI-treated STEMI patients.
Methods: 5878 patients admitted for primary PCI during 2009–2015, from a prospectively kept, electronic registry of a high-volume catheterization laboratory, were included in the analysis. LV dysfunction was defined as EF<40%, and RF as estimated glomerular filtration rate (eGFR) <60 ml/min/1.73 m^2 according to Cockcroft-Gault formula. Adjusted Cox regression models were used to assess 30-day and 3-year mortality hazard, with patients with EF≥40% and normal renal function serving as the reference group.
Results: RF was documented in 17.1% (n=1006), whereas 36.5% had LV dysfunction (n=2141). LV dysfunction and RF were separately associated with increased crude mortality rates, whereas the concurrence of both resulted in the highest mortality rate at 30 days (0.7% if no RF and normal EF vs. 5.4% if RF alone vs. 3.9% if EF<40% alone vs. 12.6% if both RF and EF<40%; p<0.001), and at 3 years (5.7% if no RF and normal EF vs. 29.0% if RF alone vs. 19.0% if EF<40% alone vs. 47.4% if both RF and EF<40%; p<0.001). After multivariable adjustment for other significant mortality predictors, such as age, previous stroke, diabetes, hyperlipidemia, anemia and Killip≥2, RF and LV dysfunction were associated with a comparable increase in mortality risk at 30 days (HR=4.1 and HR=3.7, respectively, p<0.001 for both) and at 3 years (HR=2.8 and HR=2.7, respectively, p<0.001 for both). Importantly, the combined presence of RF and low EF was independently associated with a marked increase in both 30-day (HR=6.5, 95% CI 3.7–11.4, p<0.001), and 3-year mortality (HR=4.3, 95% CI 3.3–5.6, p<0.001).
Conclusion: Apart from each being independently associated with an increased risk of mortality, the concurrence of renal failure and LV dysfunction had a synergistic negative impact on the prognosis of primary PCI-treated STEMI patients



Kaplan Meier cumulative mortality curves