Impact of mildly reduced kidney function on 5-year mortality in patients with STEMI treated with primary PCI

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PURPOSE: Previous research associated renal failure (RF), as documented by estimated glomerular filtration rate (eGFR) < 60 ml/min/1.73m², with increased mortality risk following acute myocardial infarction. Our aim was to assess the impact of baseline mild RF (eGFR 60-89 ml/min/1.73m²) on mortality during 5-year follow-up after ST-elevation myocardial infarction (STEMI) treated with primary percutaneous coronary intervention (PCI).

Methods: The study included 8378 STEMI patients undergoing primary PCI in the period from 2009 until 2019 for whom baseline eGFR data were available, according to the Modification of Diet in Renal Disease (MDRD) study equation. Cox regression models were created to assess the effect of different stages of renal failure on 30-day and 5-year mortality. Follow-up data were available for 8202 patients at 30 days and 5650 patients at 5 years.

Results: Renal function was impaired in 49% of patients (eGFR < 30 ml/min/1.73m² in 2.5%, eGFR 30-59 ml/min/1.73m² in 16.2% and eGFR 60-89 ml/min/1.73m² in 30%). Patients with eGFR < 90 ml/min/1.73m² had higher mortality rates at 30 days (10.0% vs. 1.7%, p < 0.001) and at 5 years (44.1% vs 13.5%, p < 0.001). Mortality increase was synchronous with the degree of renal failure at both 30 days and 5 years (Figure, panel A and B, respectively). At 30-days, patients with mild RF had higher adjusted mortality compared to patients with eGFR > 90 ml/min/1.73m² (HR 1.6, CI95% 1.1-2.4, p = 0.027). At 5 years, eGFR 60-89 ml/min/1.73m² was also associated with the higher adjusted mortality (HR 1.4, CI95% 1.2-1.6, p < 0.001). As expected, severe (eGFR < 30 ml/min/1.73m²) and moderate (eGFR 30-59 ml/min/1.73m²) renal failure was associated with a higher risk of mortality (30 days: HR 4.4 and 2.6 respectively; 5 years: HR 3.7 and 2.2 respectively).

Conclusions: The risk of short- and long-term mortality after STEMI increases proportionally with the degree of baseline renal failure. Compared with patients with a normal renal function, even mild renal failure (eGFR 60-89 ml/min/1.73m²) is associated with higher mortality at both 30 days and 5 years.