Effect of pre-existing chronic kidney disease, anaemia and diabetes mellitus on mid-term mortality in patients with STEMI treated with primary PCI

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Background: The negative prognostic effect of chronic kidney disease (CKD), anaemia and diabetes in patients with acute coronary syndromes is well known. However, data about the prevalence and the prognostic importance of these comorbidities in unselected, contemporary STEMI patients treated with primary PCI are limited.

Purpose: We sought to investigate the prevalence of CKD, anaemia and diabetes mellitus in this patient population, as well as possible interactions between these comorbidities.

Methods: Between January 2006 and December 2018, 3395 consecutive patients with STEMI underwent primary PCI in two centres. Hb and creatinine were determined on a blood test obtained immediately upon the arrival at the Hospital and eGFR was estimated with the CKD-EPI equation. Renal impairment (RI) was defined as stage 3B or worse CKD (eGFR $\leq$44 ml/min/1.73m^2). Anaemia was defined as Hb $<$13 g/dl in males and $<$12 g/dl in females. The outcome measure was overall mortality at a median follow-up of 1.9 years.

Results: The age of patients was (mean±SD) 67.2±12.9 years and 27.3% of them were females. Diabetes was present in 22.1%, anaemia in 18.1%, and RI in 9.8% of patients. The presence of diabetes, anemia or RI, individually or in various combination, was associated with higher mortality (see figure). Interestingly, these comorbidities presented an addictive, but non synergistic, effect (P for interaction = NS for all combinations). The covariates associated with mortality are shown in the Table. Notably, female gender was independently associated with lower mortality.

Conclusions: In contemporary patients treated with primary PCI, diabetes, anaemia and RI are frequently present, individually or in combination. All these comorbidities are strong independent predictors of mortality, and the coexistence of more conditions has addictive, but not synergistic, effect. The identification of patients at higher risk could promote a closer follow-up and more stringent measures of secondary prevention.

Multivariate Cox regression analysis

	HR	95% CI	P
Age (per year)	1.05	1.04–1.06	<0.001
Female gender	0.70	0.58–0.84	<0.001
Renal impairment	1.77	1.44–2.19	<0.001
Anaemia	1.59	1.32–1.92	<0.001
Prior stroke	1.55	1.15–2.10	0.007
TIMI risk score (per point)	1.25	1.20–1.31	<0.001
Diabetes mellitus	1.29	1.07–1.54	0.007