

Benefit of modern P2Y12-inhibitors on long-term prognosis in patients with ST-elevation myocardial infarction with and without advanced chronic kidney disease

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Background: Current guidelines on the management of patients with ST-elevation myocardial infarction (STEMI) recommend the preferred use of the modern P2Y12-inhibitors ticagrelor or prasugrel regardless of the presence of chronic kidney disease (CKD), although patients with advanced stages of CKD were excluded from randomized trials. Aim of the present study was therefore to evaluate the potential benefit of modern P2Y12-inhibitors in patients with and without advanced renal disease at admission.

Methods: All patients admitted with STEMI between 2006–2017 from a large german heart center treated with primary percutaneous coronary intervention (PCI) entered analysis. Initial CKD was estimated with the initial glomerular filtration rate (GFR), calculated with the CKD-EPI-equation, assigning them to the groups G1-G5.

Results: Of 7227 patients with STEMI and primary PCI 2669 (37%) showed no relevant reduction in GFR at admission (≥ 90 ml/min/1.73 m², G1), 2976 pts. (41%), a slight reduction (GFR 60–89 ml/min/1.73 m², G2), 880 pts. (12%) a moderate reduction (GFR 45–59 ml/min/1.73 m², G3a) and 702 pts. (10%) a moderate to severe reduction (GFR <45 ml/min 1.73

m², G3b-G5). Pts. with more advanced stages of CKD were on average older (G1: 55±11 years, G2: 66±12 years, G3a: 72±12 years, G3b-G5: 75±11 years, p<0.01) and more likely to be female (G1: 19%, G2: 26%, G3a: 40%, G3b-G5: 48%, p<0.01). Prasugrel/ticagrelor were less often given instead of clopidogrel in patients with advanced CKD (G1: 70%, G2: 45%, G3a: 31%, G3b-G5: 32%, p<0.01). The use of ticagrelor/prasugrel was associated with a reduction in 1-year-MACCE (major adverse cardio- and cerebrovascular events)-rates in patients with no/low-grade-CKD (G1-G2), while no significant reduction in MACCE could be observed for patients with moderate to severe CKD (table). Furthermore, CKD was associated with an elevation in severe bleeding events within 1 year (G1: 1%, G2: 3%, G3a: 5%, G3b-G5: 6%, p<0.01).

Conclusions: These data from a large STEMI-registry demonstrate, that modern P2Y12-inhibitors were less often used in patients with CKD and their benefit regarding MACCE disappeared in advanced stages of CKD while bleeding rates increased. These results underline the special role of patients with advanced stage-CKD in STEMI and the necessity of specialized randomized trials for these patients.

Impact of CKD-stage on outcome		CKD-stage G1	CKD-stage G2	CKD-stage G3a	CKD-stage G3b-G5
1-year-MACCE-rate (%)	Ticagrelor/prasugrel	4.5	11.0	27.4	47.3
	Clopidogrel	9.9	15.6	26.6	50.4
	Significance	<0.01	<0.01	0.6	0.7