Impact of multivessel coronary artery disease on long term prognosis in patients with ST-elevation myocardial infarction

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Topic(s):
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Background/aim: A significant proportion of patients with ST elevation myocardial infarction (STEMI) has multivessel coronary artery disease (MVD) and they are at high risk for recurrrent cardiac events. The aim of the present study is to analyse the impact of MVD on 6-year cardiovascular mortality in STEMI patients treated with primary percutaneous coronary intervention (pPCI).

Method: This study included 2700 consecutive STEMI patients hospitalized in Clinical centre of Serbia, Coronary Care Unit, between november 2005 and june 2011. Patients were divided in two groups: MVD and single-vessel disease. MVD disease was defined as diameter stenosis greater than 50% by visual assessment in more than one major coronary artery. Primary PCI was limited to the infarct related artery (IRA). Echocardiographic examination was performed before hospital discharge. Cardiovascular mortality was defined as any death from cardiovascular reason (myocardial re-infarction, sudden death or heart failure). Patients presenting with cardiogenic shock were excluded.

Results: Among 2700 analyzed patients 1152 (44.3%) had single-vessel disease and 1450 (55.7%) had MVD. Among patients with MVD, 52.9% had two-vessel disease and 47.1% had three-vessel disease. As compared with patients with single-vessel disease, patients with MVD were older and presented more often with heart failure; they were more likely to have previous coronary disease, diabetes, hypertension and chronic kidney disease; post-procedural flow TIMI <3 and was more frequently observed in patients with MVD than in patients with single-vessel disease (6.5% vs 3.3%, respectively, p<0.001). Patients with MVD had lower EF than patients with single-vessel disease 47%(IQR 40%-55%) vs 50% (IQR 49%-55%), p<0.001. Revascularization of non-IRA lesions was performed in the first few months after pPCI (median 1.5 month, IQR 1-3 months) in 1303 (89.7%) patients and in 147 (10.3%) patients with MVD revascularization was performed later during follow-up; coronary artery bypass grafting was performed in 278 (19.2%) patients and PCI (with stent implantation) in 1171 (80.8%) patients. Six year cardiovascular mortality was significantly higher in patients with MVD than in patients with single-vessel disease (10.4% vs 4.6%, p<0.001) as presented in Figure 1. In multivariate Cox regression analysis MVD remained an independent predictor for 6-year cardiovascular mortality (HR 1.55, 95%CI 1.11-2.06, p=0.041). Other independent predictors were heart failure at admission (HR 4.23, 95%CI 3.31-5.36, p<0.001), postprocedural flow TIMI<3 (HR 3.23, 95%CI 2.35-4.78, p<0.001), chronic kidney disease (HR 1.75, 95%CI 1.29-2.49, p=0.024) and older age (HR 1.03, 95%CI 1.02-1.04, p<0.001).

Conclusion: In STEMI patients treated with pPCI the presence of MVD remains independently associated with high 6-year cardiovascular mortality despite relatively early revascularization of non-IRA lesions.
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Figure 1. Kaplan-Meier curves estimating probability for six year cardiovascular mortality in patients with MVD and no MVD