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The value of D-dimer level in predicting contrast-induced acute kidney injury and prognosis in patients with acute ST-elevation myocardial infarction after PCI

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Objective

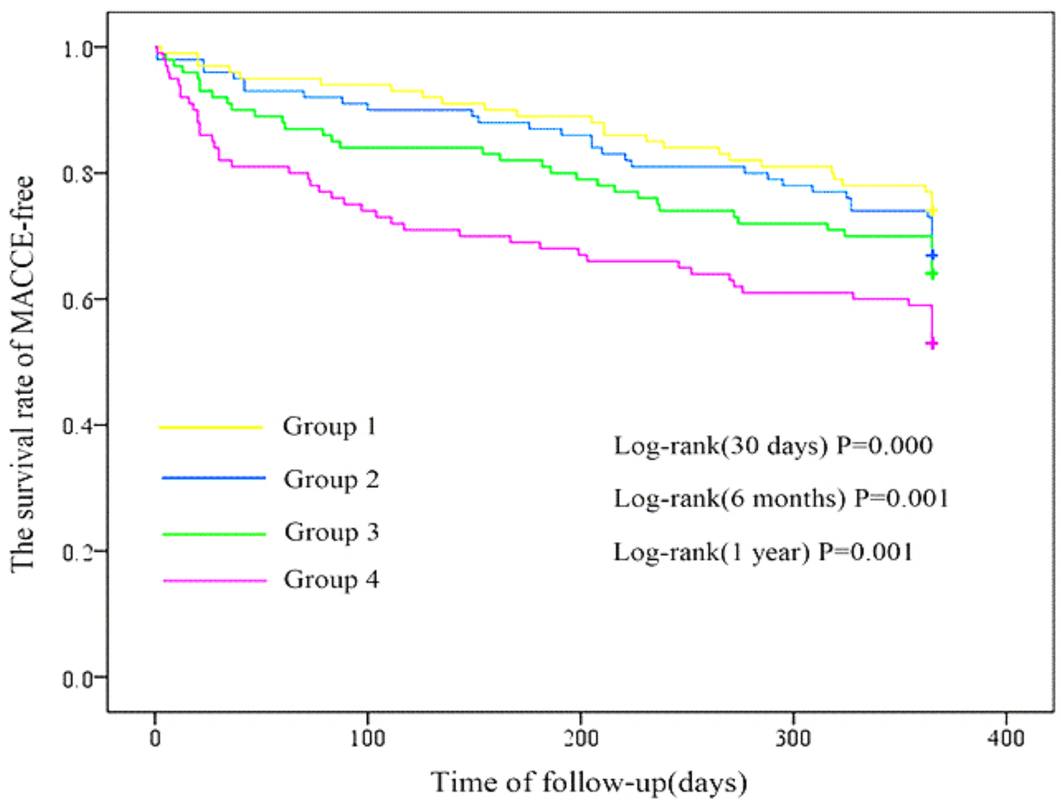
Contrast-induced acute kidney injury (CI-AKI) is a serious complication of percutaneous coronary intervention (PCI) in acute ST-elevation myocardial infarction (STEMI) patients. Early identification of high-risk patients has an essential role in preventing CI-AKI. This study was designed to evaluate the predictive value of D-dimer, a marker of thrombosis and hypercoagulable state, for CI-AKI and prognosis in STEMI patients.

Methods

This is a retrospective observational cohort study. We included 400 STEMI patients who underwent PCI. The patients were subdivided into 4 groups according to the D-dimer level by using the four-quantile method. Serum creatinine concentration (SCr) was measured before and 2 to 3 days after contrast media exposure. Clinical characteristics, biochemical parameters, and the incidence of major adverse cardiovascular and cerebral events (MACCE) during the follow-up period were recorded.

Results

CI-AKI occurred in 66 (16.5%) patients. The incidence of CI-AKI in the highest quartile of the D-dimer groups (29.0%) was higher than that in the other 3 groups. Multivariable logistic regression showed that a low D-dimer level was significantly associated with a decreased risk of CI-AKI independent of confounding factors, with an odds ratio of 0.487 (95% CI: 0.178-0.931, P=0.041) for those in the first quartile compared with those in the highest quartile. Age (OR 1.047, 95% CI 1.003-1.092), diabetes mellitus (OR 5.896, 95% CI 2.496-13.927), anemia (OR 3.488, 95% CI 1.308-9.306), and total bilirubin (OR 0.946, 95% CI 0.904-0.992) were independent predictors of CI-AKI. The incidence of major adverse cardiovascular and cerebral events (MACCEs) and all-cause mortality within 30 days, 6 months, and 1 year after PCI in the highest quartile of the D-dimer groups were higher than those in the other 3 groups.



No. at risk	0 day	30 days	6 months	1 year
Group 1	100	96	88	74
Group 2	100	96	86	67
Group 3	100	88	78	64
Group 4	100	79	68	53

Conclusions

The current study demonstrated that increasing D-dimer levels were independently associated with the incidence of CI-AKI and adverse outcomes in STEMI patients after PCI. Based on these solid results, D-dimer levels may help to screen STEMI patients with a relatively high risk of CI-AKI and MACCEs on admission.