TIMI, GRACE and Zwolle risk scores might be more useful than CADILLAC and PAMI risk scores for s-ST-segment elevation myocardial infarction as evidenced by index of microcirculatory resistance.

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Background

There are several risk scores used for prediction of short-term survival (TIMI, GRACE, Zwolle, CADILLAC or PAMI risk scores), but none of them has been tested for long-term follow-up.

Recent report showed that TIMI, GRACE, and Zwolle risk scores were better predictors of 5-year all-cause mortality in patients with ST-segment elevation myocardial infarction (STEMI) treated with primary percutaneous coronary intervention (pPCI) than the CADILLAC risk score.

However, the reason about this result was unclear.

Some studies showed that severe microvascular dysfunction is related to left ventricular remodeling and clinical outcomes for STEMI.

We assessed whether or not microvascular dysfunction following pPCI is associated with each five different risk scores (TIMI, GRACE, Zwolle, CADILLAC, and PAMI risk score).

Comparison of several risk scores

We investigated 104 patients who underwent successful pPCI for STEMI within 12 hours after onset of symptoms.

After pPCI, the index of microcirculatory resistance (IMR) was measured using a PressureWireTM Certus (St. Jude Medical, USA) at maximal hyperemia.

For each patient, five different risk scores (TIMI, GRACE, Zwolle, CADILLAC, and PAMI risk score) were calculated by the initial assessment at hospital arrival.

We divided the patients with STEMI into 2 groups (low-to-intermediate and high risk) based on the past reports for each risk scores and compared IMR between two groups.

The unpaired t-test or the Mann–Whitney test was used for unpaired comparisons.

Methods

We assessed whether or not microvascular dysfunction following pPCI is associated with each five different risk scores (TIMI, GRACE, Zwolle, CADILLAC, and PAMI risk score).

Result

Comparison of IMR between two groups in Five Different Risk Scores

Calculation of IMR

IMR is calculated from the simultaneous measurement of distal coronary pressure (Pd) and thermodilution-derived mean transit time (Tmn) of a bolus of saline injected at room temperature into the coronary artery during maximum hyperemia (papaverin).

Conclusion

TIMI, GRACE and Zwolle Risk Scores might be more useful than CADILLAC and PAMI risk scores for STEMI in terms of the IMR.