Plasma B-Type Natriuretic Peptide Level Can Predict Myocardial Tissue Perfusion in Patients Undergoing Primary Percutaneous Coronary Intervention for Acute ST-segment Elevation Myocardial Infarction

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Background

Early restoration of normalized coronary flow is the main therapeutic objective in patients with ST-segment elevation myocardial infarction (STEMI), which reduces infarct size, left ventricular dysfunction, and mortality. Despite normalized epicardial coronary flow after reperfusion therapy in patients with STEMI, a substantial proportion of patients fail to achieve successful myocardial tissue perfusion, which is associated with adverse clinical outcomes.

Method

The study population consisted of 102 patients with acute STEMI who were treated with primary PCI using DES at Uijeongbu St. Mary’s Hospital from July 2008 to July 2008. All patients achieved TIMI flow grade II or III in their culprit coronary arteries after primary PCI.

Assessment of biomarkers

- BNP: Fluorescent immunoassay method using the Triage® BNP Test (Biosite Incorporated, San Diego, California)
- hsCRP: Immunonephelometric assay (Hitachi High Technologies Co., Tokyo, Japan)
- Troponin T: Measured using the Elecsys 2010 (Roche Diagnostic GmbH, Mannheim, Germany)

Myocardial tissue reperfusion

ST-segment resolution (STR) at 120 min after primary PCI, corrected TIMI frame count (CTFC), and myocardial blush grade (MBG).

Good myocardial tissue perfusion was defined as MBG ≥ 2 or 3 and STR ≥ 70%

ROC curve analysis was performed to assess the predictive power of cardiac markers for the myocardial tissue perfusion. The area under the ROC curve for BNP was 0.645 (Fig. 1). A BNP level ≥ 78 pg/mL had a sensitivity of 81.6% and a specificity of 56.2% for predicting the myocardial tissue perfusion.

Results

1. Baseline characteristics according to BNP level

2. Angiographic characteristics according to BNP level

3. Myocardial tissue perfusion according to BNP level

4. Independent predictors for good myocardial tissue perfusion by multivariable logistic regression analysis

5. Short-term mortality and Cox regression analysis for short-term mortality

Conclusion

This study demonstrates that the plasma BNP level on admission can identify high risk groups with impaired myocardial tissue perfusion, in the setting of primary PCI in patient with STEMI.