COMBINATION OF THROMBUS ASPIRATION, HIGH-DOSE STATIN, ADENOSINE AND PLATELET MEMBRANE GLYCOPROTEIN IIb/IIIa RECEPTOR ANTAGONIST REDUCE THE INCIDENCE OF NO-REFLOW AFTER PRIMARY PERCUTANEOUS CORONARY INTERVENTION IN PATIENTS WITH ST-SEGMENT ELEVATION ACUTE MYOCARDIAL INFARCTION

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BACKGROUND

Primary percutaneous coronary intervention (pPCI) is currently the most effective treatment strategy in ST-segment elevation acute myocardial infarction (STEMI). A considerable number of patients, however, develop no-reflow phenomenon during pPCI. Compared to similar patients with adequate reflow, those with the no-reflow phenomenon have a higher incidence of death, myocardial infarction and heart failure. No-reflow is considered a dynamic process characterized by multiple pathogenetic components including distal atherothrombotic embolization, ischemic injury, reperfusion injury, and susceptibility of coronary microcirculation to injury, and current treatments are limited. We have established a risk prediction model of no-reflow in our previous studies, through which we were able to find out patients at high risk of no-reflow. The aim of this study was to investigate the effectiveness of a combination therapy for the prevention of no-reflow in patient with STEMI undergoing primary PCI.

METHODS

A total of 621 patients with STEMI who underwent emergency primary PCI were enrolled in this study. Patients with high risk of no-reflow (no-reflow score \( \geq 10 \), by using a no-reflow risk prediction model \( n = 216 \)) and combination therapy group \( (n = 108) \) were randomly divided into control group \( (n = 108) \). Patients in control group received conventional treatment, while patients in combination therapy group received high-dose (80 mg) atorvastatin pre-treatment, intracoronary administration of adenosine (140 \( \mu \)g/min/kg) during PCI procedure, platelet membrane glycoprotein IIb/IIIa receptor antagonist (tirofiban, 10 \( \mu \)g/kg bolus followed by 0.15 \( \mu \)g/kg/min) and thrombus aspiration. Myocardial contrast echocardiography (MCE; SonoVue®; Bracco) was performed to assess the myocardial perfusion 72 hours after PCI. Major adverse cardiac events (MACE) were followed up for six months.

RESULTS

A total of 1217 patients were admitted to our hospital during the enrolment for AMI; 962 (79%) were considered to have STEMI by 12-leads electrocardiography and 769 had no documented or self-reported prior AMI. Of the first STEMI, 17 died and 15 were transferred to other hospitals before a decision on whether or not to undergo PCI was made. Sixty-four were excluded due to contraindications to reperfusion and 41 patients refused to participate in this study. Finally, 621 patients were enrolled (Figure 1). Among which 216 (34.8%) high risk patients of no-reflow were selected by no-reflow risk prediction model. Patients demographics, angiography and procedural data examined in different group are shown in Table 2. No-reflow occurred in 11 cases (11/405, 2.7%) in low risk patients, 38 cases (38/108, 35.2%) in control group and 3 cases (2.8%) in combination therapy group. (Figure 2).

MCE at 72 hours after PCI procedure suggested a higher A × β value in combination therapy group than that of control group (Figure 3, 4). Six months clinical follow-up was obtained in 552 patients. Events rates are presented in Table 3. There were 6 (6.3%) events (1 death, 2 non-fatal MIs and 3 revascularizations) in combination therapy group, significantly lower than 12 (13.2%) events (4 deaths, 3 non-fatal MIs and 5 revascularizations) in control group.

CONCLUSION

Our study discovered that using no-flow risk prediction model to screen AMI patients who had been suffered with high risk of no-reflow, and pre-treated them with combination treatment could significantly lower the incidence of no-reflow, and further improved the prognosis. MACE happened in combination treatment group decreased by 55% compared with control group.