Stress Hyperglycemia in hospital is a Useful Prognostic Factor in Patients with Acute Myocardial Infarction

Backgrounds: It has been suggested that stress hyperglycemia at admission in patients with acute myocardial infarction (MI) increases in-hospital mortality and is associated with poor prognosis. We sought to evaluate whether stress hyperglycemia at admission may have a prognostic role in Korean patients with acute MI.

Methods: Of 914 patients with acute MI between February 2008 and June 2009, 574 patients without a history of diabetes were divided into 3 groups according to the level of admission glucose: group 1 (<140 mg/dL, n=331), group 2 (140~199 mg/dL, n=177), and group 3 (≥200 mg/dL, n=66). The incidence of in-hospital major adverse cardiac events and 1-year mortality were compared among the groups.

Results: The mean age was 64.8, 64.2, and 68.3 years in group 1, 2, and 3. The proportion of atypical chest pain (15.7%, 14.7%, 40.9; p<0.001), Killip class IV (2.4%, 5.6%, 34.8%; p<0.001), chronic lung disease (1.8%, 1.1%, 7.6%; p<0.008), decreased left ventricular ejection (<40% by echocardiography)(8.6%, 11.9%, 23.6%; p<0.004) and in-hospital mortality (3.5%, 7.5%, 19.7%; p<0.001) progressively increased with higher tertiles of elevated values of initial serum glucose. No significant differences existed among the three groups in the success rate of percutaneous coronary intervention and in the prevalence of hypertension, smoking, and hyperlipidemia. During hospitalization, group 3 had higher rates of cardiogenic shock (3.6%, 11.3%, 39.4%; p<0.001), atrioventricular block (3.0%, 6.8%, 37.3%; p<0.001), and in-hospital mortality (2.1%, 6.2%, 22.7%; p<0.001). One-year mortality was higher in group 2 than in group 1 [Hazard ratio (HR)=2.01, % CI (confidence interval) 1.02-3.97, p=0.045], in group 3 than in group 1 (HR=2.87, % CI 1.32-6.24, p=0.008), and in group 3 than in group 2 (HR=2.57, % CI 1.33-4.96, p=0.005). Conclusion: Admission stress hyperglycemia in patients with acute MI was associated with higher mortality both in-hospital and at one year, suggesting that its presence should alert health care providers to the potential for poor outcome and the need for aggressive attempts to reduce complications.

Effect of Administration of Neu2000 on Ischemic Reperfusion Injury and Left Ventricular Remodeling in a Porcine Model of Acute Myocardial Infarction

Background: 2-hydroxy-5-(2,3,5,6-tetrafluoro-4-trifluoromethyl-benzylamino)-benzoic acid (Neu2000) is a rational therapeutic drug derived from sulfasalazine, a conjugate of 5-aminosalicylic acid and sulfapyridine designed to protect neurons from oxidative stress in the central nervous system.

Objectives: The aim of this study was to examine the effect of administration of Neu2000 on ischemic reperfusion injury and left ventricular remodeling in a porcine model of acute myocardial infarction. Methods: Acute myocardial infarction was made by balloon occlusion (3.0*20mm) in middle left anterior descending artery for 35 minutes. Neu2000 (n=18) and control saline (n=20) was infused via intravenous route for 15 minutes from 20 minutes to 35 minutes after balloon occlusion in each group. Myocardial SPECT was checked at 1 day and after 28 days after the completion of experiment.

Results: There were no significant differences in the mortality rate after the completion of the experiment and the incidence of the development of ventricular tachyarrhythmia during and after infusion of Neu2000 or control saline between the two groups (50%, 61% in Neu2000 group vs. 65%, 70% in control group, p=0.350, p=0.564, respectively). We can obtain baseline (1 day) and follow-up SPECT (28 day) data in 9 pigs in Neu2000 group and 7 pigs in control group. Baseline ejection fraction was significantly higher (48±9% vs. 37±12%, p=0.047) and there were trends toward lower left ventricular end systolic and diastolic volumes (21±8 mL vs. 38±24 mL, p=0.066, and 39±9 mL vs. 59±31 mL, p=0.098) in Neu2000 group compared with control group. At 28 days, there were trends that the increases of left ventricular end systolic and diastolic volumes were smaller (△=+20±11 mL vs. +60±40 mL, p=0.085, and △=+13±13 mL vs. +76±38 mL, p=0.058) and the decrease of ejection fraction was smaller (△=-6.3±6.06% vs. -7.8±11.52%, p=0.166) in Neu2000 group compared with control group. Conclusion: The administration of Neu2000 may reduce the ischemic reperfusion injury and left ventricular remodeling in a porcine model of acute myocardial infarction.