BENEFIT OF NEW ANGIOTENSIN RECEPTOR BLOCKER, FIMASARTAN, IN A PORCINE MODEL OF ACUTE MYOCARDIAL INFARCTION

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Background: The efficacy of fimasartan on acute myocardial infarction (MI) and ischemic heart failure has yet to be investigated. We sought to evaluate the effect of fimasartan, a new angiotensin receptor blocker (ARB) in a porcine model of acute MI.

Methods: Ten pigs were randomly allocated to group 1 (sham operation, n=2), group 2 (no angiotensin-converting enzyme inhibitor (ACEI) or ARB, n=2), group 3 (perindopril 2 mg daily, n=2), group 4 (valsartan 40 mg daily, n=2), or group 5 (fimasartan 30 mg daily, n=2). Study medications were started orally after induction of acute MI by occlusion of the left anterior descending artery with a balloon catheter for 40 min. Two-dimensional echocardiography, myocardial perfusion single photon emission computed tomography (SPECT) with technetium-99m sestamibi, and F-18 fluorodeoxyglucose (FDG) cardiac positron emission tomography (PET) were performed at baseline, 1 week, and 4 weeks after the procedure to assess left ventricular (LV) function, infarct size, and viability. At 6 weeks, the pigs underwent iodine-123 meta-iodobenzylguanidine (MIBG) scan for visualization of cardiac sympathetic activity, and were sacrificed for histomorphometric infarct size assessment.

Results: Among pigs in which acute MI was induced (group 2~5), 1-week, and 4-week LV ejection fraction, LV end-diastolic and end-systolic volume indices, E/E', infarct size, and viable myocardium size were similar. Histomorphometric infarct size was well correlated with the number of segments matched between SPECT and FDG PET (r=0.814, P=0.004). The heart/mediastinum count ratios on MIBG images were highest in the sham operation group (26.4±1.4) and more increased although not statistically significantly in groups 3 (17.3±4.8), 4 (19.4±1.1), and 5 (18.9±3.9), compared to group 2 (15.0±2.7).

Conclusions: Use of new ARB, fimasartan, following acute MI may confer additional cardioprotective benefit comparable to that of other ACEI or ARB by restoring cardiac sympathetic nerve activity.