Phenytoin Stress Echocardiography: A New Pharmacologic Test to Evaluate Mitral Regurgitation

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Background: Mitral regurgitation (MR) is a dynamic condition, but its severity varies with alterations in LV loading conditions. This is a problem especially when the MR severity is less than suspected clinically.

Methods: We developed a Phenytoin Stress Echocardiography (PSE) protocol using this selective a1-adrenoreceptor agonist, given carefully through an open peripheral intravenous line in 100 mcg aliquots, to increase mean arterial pressure by >20 mm Hg, while performing quantitative Doppler in 33 adult patients. Using TEE in 25 and TTE in 8 pts, and monitoring blood pressure after each dose of phenytoin, we used spatial mapping with color Doppler at Nyquist 50-60 cm/sec, regurgitant orifice area (ROA) using flow convergence, MR stroke volume, and an overall grading on a 1-4 scale representing a weighted average of all methods.

Results: Echo parameters of MR increased from phenytoin, see table. The total dose average 380 mcg (range: 50-1500). No adverse effects were noted. In 10 pts ROA increased by > 0.2 cm2; in some of these, the PSE-documented propensity to develop severe MR explained the previous clinical events and improvements. In 23 pts, ROA increased by < 0.2 cm2; in some of whom, failure to increase MR to surgical levels reinforced the safety of delaying valve repair. Conclusion: PSE can document dynamic changes in the severity of MR with increasing afterload, which can assist with clinical decision making, particularly when MR is less than was clinically suspected.

Qtc Interval Shortening During Dipyridamole Stress Test Predicts Severe Coronary Artery Disease in Patients With Left Bundle-Branch Block

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Background: Stress Echo, estimating transient changes of regional kinesis and systolic dysfunction, is an ECG marker of transmural ischemia, but its utility is limited by its low sensitivity and specificity.

Methods: We studied 12 patients within 4 days of acute myocardial infarction with transthoracic low dose echocardiogram and 6 staged intravenous injection of ergonovine (50 pg/kg). Each patient received 0.84 mg/kg over 10 min. OTC intervals were measured lead by lead, in blinded manner, at rest and peak stress; in all leads showing ST changes the fractional percentage difference in QT intervals (Delta QTc) from baseline was calculated. We considered significant a Delta QTc cut-off value of 65 % reduction of luminal diameter. Results: Prevalence of CAD was 80 % (normal coronary arteries were found in 3 pts). On the basis of QTC behavior during DST, 2 groups (Gr) were identified: Gr I = "shorteners", 10 pts (Delta QTc - >15% A) and Gr II = "non-shorteners", 5 pts (Delta QTc + >13%), p=0.0001. Significant differences between the 2 groups were found regarding the prevalence of stress-induced dyskinesia: Gr I = 9/10 pts (90 % vs Gr II = 1/5 pts(20 %), p < 0.05) and the severity of "s Narowing in the vessel supplying the stress-induced dysynergic area (Gr I = 94 ± 4 % vs Gr II = 72.5 ± 2.5 %, p <0.001). Conclusion: pts with LBBB, QTcS during DST, is associated with stress induced dyskinesia and more severe stenotic lesions in the ischemic area at risk. This simple ECG parameter could complement other markers in identifying severe CAD in LBBB pts.