Title: The declining positivity rate of stress echocardiography based on regional wall motion abnormalities: where have all the patients with positive test gone?

Topic: 3.1.10 - Stress Echocardiography

Category: General

Option: Young Investigator Award (YIA) Clinical

Funding Acknowledgements: none

P. Ramirez¹, L. Cortigiani², M. Coltelli³, F. Bovenzi², E. Picano⁴ - (1) National Institute of Medical Sciences and Nutrition Salvador Zubiran, Mexico City, Mexico (2) San Luca Hospital, Lucca, Italy (3) Department of Computer Science and Technology ESTAR, Pisa, Italy (4) Institute of Clinical Physiology, CNR, Pisa, Italy

Background. Previous studies have suggested a decline in positivity of stress cardiac imaging based on regional wall motion abnormalities (RWMA).

Aim. To assess the rate of RWMA positivity of stress echocardiography (SE) over 3 decades in the same primary care SE lab and the impact of newly developed parameters on positivity rate in contemporary patients.

Methods. We retrospectively assessed the rate of SE positivity in 7,534 SE tests (dipyridamole in 5,024, dobutamine in 2,510) in consecutive patients with known or suspected coronary artery disease and/or heart failure who performed SE in a primary care referral center from 1991 to 2018. All tests were performed with the same protocols (0.84 mg/kg of dipyridamole, up to 40 mcg/kg/min of dobutamine). Starting May 2005, SE based on RWMA was complemented by assessment of Coronary Flow Velocity Reserve (CFVR) during dipyridamole stress (positive response, CFVR ≤ 2.0 of left anterior descending coronary artery). Starting January 2016, we added left ventricular contractile reserve (LVCR, peak stress/rest ratio of Force calculated as systolic blood pressure by cuff sphygmomanometer/end-systolic volume by 2D), with a positivity criterion ≤1.1 for dipyridamole and ≤2.0 for dobutamine. Starting October 2016, we added B-lines by lung ultrasound (4-site simplified scan, each site scored...
from 0 to 10), with the positivity criterion of stress B-lines \( > \) rest of \( \geq 2 \) points.

Results. There was a progressive decline over time in the rate of SE positivity based on RWMA from 24% (1991-1999) to 10% (2000-2009) down to 4% (2010-2018): see figure. In the last decade positivity rate was 28% with CFVR, 16% with LVCR, and 11% with B-lines. The technical success rate was 97% for RWMA, 96% for CFVR, 99% for LVCR and 100% for B-lines. Of 310 patients who were consecutively investigated with integrated quadruple imaging (RWMA+CFVR+LVCR+B-lines) from October 2016 to April 2018, 109 (35%) exhibited positivity of at least 1 functional parameter.

Conclusion. Over three decades, we observed a dramatic decline in SE positivity rate based on classical RWMA. In the last decade, the positivity rate rose sharply thanks to the stepwise introduction of CFVR, LVCR and B-lines as additional positivity criteria in integrated quadruple SE.

Temporal trends of SE positivity rate
I hereby certify that this abstract has not been previously published or presented at any international congress and that I have read and approved the Abstract Submission Rules of the Abstract Submission Service and the Web Site Terms Conditions.