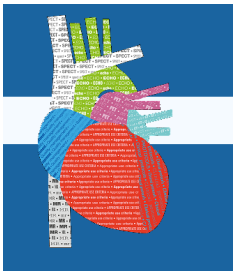

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Relationship Between Post-Stress LVEF Drop and Myocardial Perfusion Defects in Routine Gated SPECT Scans

Background: Automated programs are available for assessing left ventricular ejection fraction (LVEF) from technetium-99m sestamibi gated myocardial perfusion single-photon emission computed tomography (gated MPS). It has been known that the post-stress LVEF drop is associated to regional myocardial perfusion defects and predicts the presence of severe coronary artery disease (CAD). However, many factors, like overestimation and software processing variability of LVEF, time delay of post-stress image acquisition, and cutoff point of post-stress LVEF drop can interfere on the real and correct assessment of this endpoint. The aim of this study was to assess the relationship between post-stress LVEF drop and myocardial perfusion defects in routine gated MPS.

Methodology: A total of 356 patients (mean age 60 +/-10 years old, 58% females) with available rest and post stress gated MPS data were enrolled. Rest and post-stress LVEF were automatically generated and the difference between rest and post-stress was calculated. Post-stress LVEF drop ≥ 5 units was considered significant. Visual myocardial perfusion analysis and automated total perfusion defect (TPD) were compared between the groups according to significant post-stress LVEF drop: G1, without significant drop; G2, with significant drop. A p value <0.05 was considered statiscally significant.

Results: From a total of 356 gated MPS evaluated, 264 (74%) did not present a significant post-stress LVEF drop (G1, mean LVEF: 65±14% x 68±14%, rest x stress, respectively) and 92 (26%) presented a post-stress LVEF decrease ≥ 5 units in relation to rest (G2, mean LVEF: 70±14% x 62±14%, rest x stress, respectively). In relation to visual myocardial perfusion analysis, we did not observe a significant difference between groups. In G1, 155 (59%) MPS were normal; 29 (11%) were ischemic scans; 71 (27%) were infarction scans; and 9 (3%) were ischemic/infarction scans. In G2, we observed 52 (56,5%) normal scans; 10 (11%) ischemic scans; 25 (27%) infaction scans; and 5 (5,5%) ischemic/infarction scans. The post stressTPD was 5.1±7.4% in G1 versus 6.4±10.2% in G2, p=0.09.

Conclusion: In routine gated MPS, a significant post-stress LVEF drop did not show significant association with the presence of myocardial perfusion defects. Perhaps, this index may only be considered in conjunction with the presence of others risk factors to CAD. Futhermore, overestimation and software processing variability of LVEF and time delay of post-stress image acquisition could impact on the LVEF measurement by gated MPS.

Country/Organization invited to participate

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