Regadenoson stress does not increase the amplitude of respiratory motion

*J Nucl Med May 2013 vol. 54 no. supplement 2 351*

Venkatesh Murthy¹, Judson Jones², Jeffery Meden¹, Edward Ficaro¹ and James Corbett¹

Author Affiliations

¹Radiology, University of Michigan, Ann Arbor, MI
²Siemens Molecular Imaging, Knoxville, TN

Abstract

**Objectives** Respiratory motion decreases image quality during myocardial perfusion imaging (MPI) and may lead to serious artifacts. Because regadenoson is associated with dyspnea and PET MPI is performed during maximal hyperemic stress, respiratory motion may be more significant during stress than rest.

**Methods** Consecutive subjects underwent rest/regadenoson stress MPI with Rb-82 with simultaneous respiratory monitoring. PET data were acquired in list mode, mCT PET-CT imaging system (Siemens Medical Solutions, Hoffman Estates, IL). After excluding the initial 90 seconds, to allow for first pass transit of tracer through the heart, the average tracer position of all activity in the field of view was computed as a function of time (250 ms bins), and filtered with a bandpass digital filter (low/high frequency cutoffs 4.0/40.0 bpm). Average tracer movement (ATM), is defined as the standard deviation of the average tracer position, and is proportional to the amplitude of organ motion due to respiration. ATM was computed for rest and stress studies and compared. Simultaneous respiratory monitoring was performed with a bellows (Ivy Biomedical Model 6000, Branford, CT).

**Results** 46 patients and 7 volunteers had PET MPI and respiratory tracings (age 58±13, 25 male/27 female, referral indications: chest pain/dyspnea - 30, preoperative - 4, viability - 8). Respiratory motion plots computed using average tracer position over time were comparable to standard respiratory tracings (figure 1A). ATM was 0.273±0.06 mm at rest and 0.278±0.059 mm at stress (P=0.71). ATM at rest and stress were highly correlated (Figure 1B, Pearson correlation 0.825, P<0.0001). Linear regression analysis without an intercept revealed a slope of 0.981 (95% CI 0.945-1.017, P<0.0001) suggesting no meaningful change in the amplitude of respiratory motion with regadenoson administration.

**Conclusions** Using a novel method to track and quantify respiratory motion during PET acquisition, the amplitude of respiratory motion does not meaningfully increase during regadenoson stress.