

CORONARY ARTERY DISEASE

Stress-only SPECT reduces radiation exposure but does not affect mortality

For patients with suspected coronary artery disease, current guidelines for single-photon emission CT (SPECT) myocardial perfusion imaging recommend that images are acquired both after stress and also at rest to enable diagnosis and assess patient risk. Su Min Chang and colleagues have shown that a protocol that only includes an at-rest image if the initial stress image is abnormal does not affect mortality of assessed patients, but substantially reduces radiation exposure. “At a time when SPECT myocardial perfusion imaging is beleaguered by frequent isotope shortages, a steep decrease in reimbursement, and challenges from other modalities with growing evidence bases,” comments Andrew Einstein of Columbia University in New York, NY, USA, “the ability to perform a shorter, lower-dose protocol, as offered by stress-only imaging, is important for the future of this modality.”

For more than a decade, the study investigators have advocated the use of at-rest imaging only in patients with equivocal or abnormal stress images as a means to cut down on radiation exposure

and costs as well as to free-up imaging time for additional patients. However, others have been concerned about the safety of this type of approach. Chang *et al.* thus set out to evaluate the impact of this approach on the mortality of patients with a normal SPECT image after stress.

The investigators analyzed data for 16,854 patients whose SPECT stress imaging studies were considered normal when performed at The Methodist Hospital in Houston, TX, USA, between 1999 and 2007. Patients were considered to have normal stress SPECT results if perfusion was homogenous throughout the myocardium, left ventricular cavity size was normal, their left ventricular ejection fraction was no less than 50% with normal regional wall motion, and the quantified perfusion defect size was 0% at 2.5 standard deviations.

Mean baseline age was 59.2 years. Mean follow-up time was 4.76 years, with a minimum time of 16 months in those who did not experience an event. As expected, the 8,034 patients who underwent stress-only imaging received a significantly lower radiopharmaceutical dose than the 8,820 individuals who underwent both stress

and at-rest imaging (21.3 ± 10.7 mCi versus 55.1 ± 11.9 mCi; $P < 0.001$). Annualized unadjusted mortality was 2.57% and 2.92%, respectively; when adjusted for baseline clinical characteristics, no statistically significant difference was demonstrated ($P = 0.89$).

“By supporting the use of stress-first imaging, this study strengthens the use of a protocol that can reduce radiation burden to patients, improve laboratory workflow, reduce demand for scarce radioisotopes, and decrease health-care costs” states Dr Einstein.

Bryony M. Mearns

Original article Chang, S. M. *et al.* Normal stress-only versus standard stress/rest myocardial perfusion imaging: similar patient mortality with reduced radiation exposure. *J. Am. Coll. Cardiol.* 55, 221–230 (2010)

