

ORAL PRESENTATION

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Stress CMR myocardial perfusion imaging (CMR-MPI) is cost-effective compared to nuclear SPECT: a retrospective cost-effectiveness analysis

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Background

Stress CMR myocardial perfusion is a strong risk-stratifying tool increasingly used for patient management. However, the cost-effectiveness of this technique in patients with suspected ischemia, has never been studied against nuclear SPECT.

Methods

From 2003-2011, 707 patients underwent CMR-MPI for ischemia assessment in our center. Estimated pre-test cardiac risk derived from a combined Framingham Heart Study and Diamond Forrester risk percentage was used to match CMR patients against 39,876 patients who underwent pharmacologic stress SPECT in another tertiary-care center during the same time period. Framingham scoring system for the prediction of cardiovascular risk was also stratified by presence or absence of prior evidence of CAD. A validated computer algorithm was used to perform 1:1 patient risk-matching. For all patients, cardiac events (acute MI/death), angiographically-significant CAD, percutaneous coronary intervention and bypass grafting, repeat stress testing/imaging within 2 years, and cost estimates for these events from national average were collected for cost-effectiveness analysis.

Results

One-to-one risk-profile matching between CMR-MPI and SPECT was successful in 704 patients (99.6%). Ischemia by SPECT was positive, negative, and equivocal in 8%, 74%, and 18%, which compared with 22%, 75%,

and 3%, respectively by CMR-MPI. A negative SPECT was associated with a 2-year cardiac event rate of 4.6% compared to 1.3% by CMR-MPI ($p=0.002$). Other items relevant to cost-effectiveness analysis using imaging for “gate-keeping” stratification are shown in Table 1.

Conclusions

In patients with an intermediate risk of ischemic heart disease, stress CMR myocardial perfusion is cost-effective when compared to pharmacologic stress SPECT. A negative stress CMR perfusion study is associated with a lower 2 year event rate and lower downstream costs.

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Table 1

	CMR-MPI Negative or equivocal for Ischemia	SPECT Negative or equivocal for Ischemia
Cardiac Event Rate (%/2 years)	N=9 (1.3%)	N=32 (4.6%)
Need for Repeat Imaging within 2 years	N=27 (6%)	N=99 (14%)
Need for coronary angiography within 2 years	N=24 (3%)	N=155 (22%)
PCI or Bypass Surgery Performed within 2 years	N=15	N=46
Estimated Cost of SPECT or CMR-MPI (N=705)	\$704,000	\$598,400
Estimated Costs of Related Patient Care over 2-yrs (\$)	\$789,642	\$3,419,355