

Nuclear Myocardial Perfusion Imaging versus Stress Echocardiography in the Preoperative Evaluation of Patients for Kidney Transplantation

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DISCLOSURES

- PHK is a consultant and speaker for GE Healthcare and receives grant support from Astellas.
- AA receives grant support from the National Institutes of Health (NIH), Astellas, GLOBAL and is a consultant for GLOBAL. He is on the advisory board of Advance Cardiac Imaging Consortium (ACIC) and Cardinal Health.

PURPOSE AND BACKGROUND

- Goal of this project was to evaluate the diagnostic accuracy, cost effectiveness and appropriate use of SPECT myocardial perfusion imaging (SMPI) versus stress echocardiography (SE) in the preoperative evaluation of patients for kidney transplantation.
- Cardiovascular disease, specifically coronary artery disease (CAD), is a leading cause of morbidity and mortality for this population before and after kidney transplantation.
- Patients undergoing pre-operative evaluation for kidney transplantation are routinely imaged for coronary artery disease with either SPECT myocardial perfusion imaging (SMPI) or stress echocardiography (SE).

METHODS

- A single-institution, retrospective study was performed over a 2-year time period.
- Data included age, gender, cardiac risk factors, and imaging results.
- SMPI was performed with regadenoson and SE predominantly with dobutamine. Findings on subsequent coronary angiography were correlated.
- Utilizing reimbursements from the Center for Medicare Services (CMS), a cost analysis for SMPI versus SE was modeled.

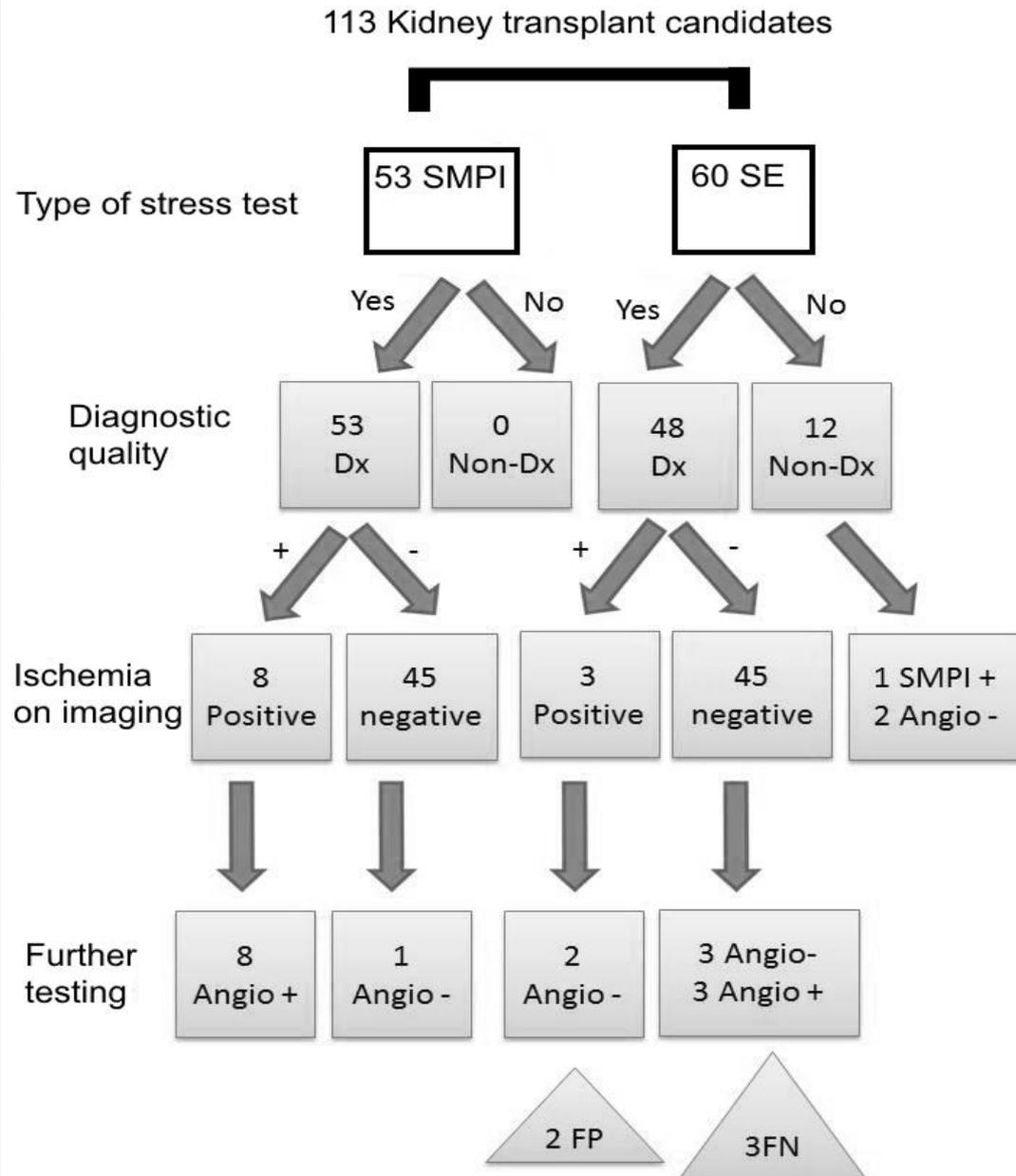
RESULTS- DEMOGRAPHICS AND SMPI

- 113 patients underwent imaging (53 SMPI and 60 SE).
- Groups had similar demographics and cardiac risk factors.
- 100% of SMPI studies were diagnostic compared to only 82% (48/60) in SE group, and this result was statistically significant ($X^2 = 7.96$, $p < 0.01$). Most common reason for a non-diagnostic test was not reaching target heart rate.
- In the SMPI group, 15% (8/53) had ischemia on imaging and all had subsequent coronary angiography which confirmed obstructive coronary lesions. One patient with negative SMPI had subsequent angiogram, which was negative.

RESULTS- STRESS ECHOCARDIOGRAPHY (SE)

- In the SE group, 5% (3/60) had ischemia on imaging and two had subsequent angiography which were negative.
- 3 of 12 patients with non-diagnostic exams underwent further testing.
- One patient had a follow-up positive SMPI but no subsequent coronary angiography.
- The other two patients underwent coronary angiography that were negative.
- Of the 45 negative SE, six had angiography with positive result for obstructive coronary artery disease in 3/6.
- Please see next slide for flowchart of cardiac testing.

FLOWCHART OF TESTING FOR CARDIAC RISK STRATIFICATION

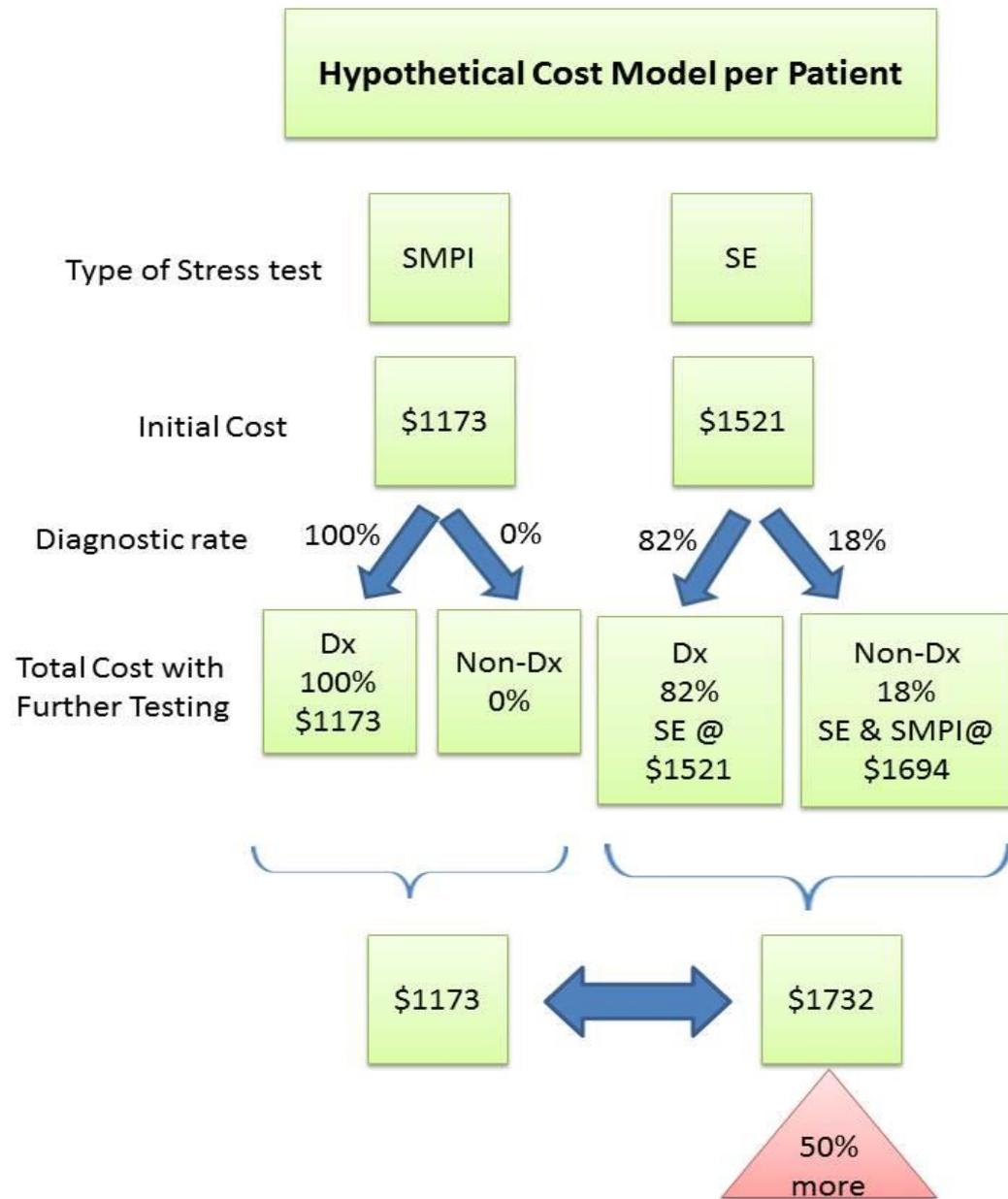


RESULTS- COST MODELING

- For modeling of cost analysis, CMS rates of \$1,173 and \$1,521 were utilized for SMPI and SE respectively.
- The model assumes that all non-diagnostic imaging would be referred for further stress testing (i.e. non-diagnostic SE would be referred for SMPI).
- 18% of SE patients had a non-diagnostic SE and therefore would then go to further non-invasive testing with SMPI. This 18% therefore would incur the charges for both SE and SMPI.
- This model estimates that initial non-invasive testing with SE versus SMPI results in 50% greater cost.
- Please see next slide for figure of cost modeling.

COST ANALYSIS

- Modeling based on assumption that non-diagnostic imaging would require further stress imaging
- Charges are based on CMS/Medicare charges



CONCLUSIONS

- For pre-operative evaluation of kidney transplantation, SMPI is more often diagnostic than SE.
- A cost model estimates that initial non-invasive diagnostic testing with SE would result in approximately 50% greater cost compared to SMPI
- Our data also suggests that SMPI has greater diagnostic accuracy than SE.
- Therefore, this single institution experience supports SMPI as the more appropriate test.