

Echocardiography-based score to improve risk stratification before renal transplantation

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Cardiovascular disease is the main cause of death in patients with end-stage renal disease. Half of all deaths are cardiac. Although improved survival of renal transplant recipients compared with patients undergoing dialysis has been shown, cardiovascular mortality remains twice that of the general population. These patients are therefore carefully screened to identify and treat cardiovascular risk factors. Efforts to reduce the high cardiovascular mortality and morbidity associated with renal replacement therapy are, to this point, limited to coronary revascularization, changes in immunomodulators and use of lipid-lowering agents.

Although several parameters defined by echocardiography have been shown to predict poor outcome in end stage renal disease, only limited data on echocardiographic prognostic factors in renal transplant recipients are available. Consequently, current guidelines do not include echocardiography parameters for patient selection before renal transplantation.

The aim of this study was to determine patients with high mortality after renal transplantation despite selection according to current criteria. It was evaluated 219 consecutive patients who underwent renal transplantation between 1996 and 2001. The primary end point was all-cause mortality. Patients with severe and inoperable

coronary artery disease or severely impaired left ventricular ejection fraction < 25%, severe lung disease, body mass index 35 kg/m² or weight < 40 kg, HIV positive, active immunological disease, sepsis, severe peripheral vascular disease and those in remission from cancer treatment were not included in the transplant list, in accordance with European Guidelines.

The results shown that non-survivors were older ($p < 0.001$), had larger left ventricular end-systolic diameter (LVSD) ($p < 0.001$) and end-diastolic diameter ($p = 0.002$), and lower ejection fraction ($p < 0.001$). Left ventricular mass index, maximal wall thickness and the proportion with mitral annular calcification were significantly higher in the non-survivors. The risk factors for ischemic heart disease, exercise test data and hematological and biochemical variables were not significantly different between the two groups.

This study shown that age and three parameters derived from conventional echocardiography can identify patients at increased mortality after renal transplantation, despite patient selection according to current guidelines: age > 50 years, LVESD > 3.5 cm, maximal wall thickness > 1.4 cm and mitral annular calcification. A restrictive filling pattern did not predict mortality.

The 5-year survival estimates for 0, 1, 2 and 3 prognostic factors were 96%, 86%, 69% and

38%, respectively. Those with no echo prognostic factors had good outcome irrespective of age. Patients >50 years who had two additional prognostic factors had poor 5-year survival (only 18 %) after renal transplantation.

In conclusion, these parameters may be useful in identifying patients at highest risk who require

further investigation and treatment before renal transplantation.

In addition to selection according to current guidelines, age and three conventional echocardiography parameters may further improve risk stratification before renal transplantation. □



Comment on the paper:

Rajan Sharma, Eric Chemla, Maite Tome, et al – Echocardiography-based score to predict outcome after renal transplantation. *Heart* 2007; 93:464-469