ASSESSMENT OF THE SURVIVAL BENEFITS OF LISTING ADVANCED HEART FAILURE FOR HEART TRANSPLANTATION THROUGH A MONTE CARLO MICROSIMULATION MODEL

ACC Poster Contributions
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Background: Heart Transplantation (HTx) is considered as an acceptable alternative for the treatment of advanced heart failure (aHF). However, we currently don’t know which patients benefit from this treatment and to what extent they do. We developed a Monte Carlo microsimulation model to assess this issue.

Methods: A decision tree with two Markov’s nodes was built (medical treatment vs. HTx listing). 10,000 trials (“patients”) were run for 60 cycles, with monthly probabilities taken from large databases (UNOS, ISHLT (2002 to 2007 data) and INTERMACS) and from a large cohort with aHF (Kalogeropoulos et al, JACC 2009). Representative clinical scenarios were chosen for the different stages: stable aHF, improvement, admission, VAD implantation, HTx from elective, VAD or urgent, and death. Tracking variables were used to build survival curves. The model was built in Treeage 2009 and statistical analysis performed in STATA 11.0.

Results: The model presented accurate internal validity with survival curves similar to original data. A significant survival benefit was seen with the HTx listing strategy, with an absolute risk reduction of 10.3% (95% CI 9-11.7%; p<0.001). Hazard ratio was 1.04 (95%CI 0.98-1.10; p=0.18) for the first 24 months, and 0.45 (95%CI 0.42-0.49; p<0.001) for the second part. By several sensitivity analyses, survival benefit was seen beginning from a aHF mortality of 7%.

Conclusions: The model showed than HTx listing may offer a survival advantage in aHF beginning at an annual mortality of 7%.