

Cardiac Donor Risk Factors Predictive of Short-Term Heart Transplant Recipient Mortality: An Analysis of the United Network for Organ Sharing Database

R.A. Sorabella^a, L. Guglielmetti^a, A. Kantor^a, E. Castellero^a, H. Takayama^a, P.C. Schulze^b, D. Mancini^b, Y. Naka^a, and I. George^{a,*}

^aDivision of Cardiothoracic Surgery and ^bDivision of Cardiology, New York Presbyterian Hospital, Columbia University College of Physicians and Surgeons, New York, New York, USA

ABSTRACT

Introduction. To address the shortage of donor hearts for transplantation, there is significant interest in liberalizing donor acceptance criteria. Therefore, the aim of this study was to evaluate cardiac donor characteristics from the United Network for Organ Sharing (UNOS) database to determine their impact on posttransplantation recipient outcomes.

Methods. Adult (≥ 18 years) patients undergoing heart transplantation from July 1, 2004, to December 31, 2012, in the UNOS Standard Transplant Analysis and Research (STAR) database were reviewed. Patients were stratified by 1-year posttransplantation status; survivors (group S, $n = 13,643$) and patients who died or underwent cardiac retransplantation at 1-year follow-up (group NS/R = 1785). Thirty-three specific donor variables were collected for each recipient, and independent donor predictors of recipient death or retransplantation at 1 year were determined using multivariable logistic regression analysis.

Results. Overall 1-year survival for the entire cohort was 88.4%. Mean donor age was 31.5 ± 11.9 years, and 72% were male. On multivariable logistic regression analysis, donor age >40 years (odds ratio [OR] 1.44, 95% confidence interval [CI] 1.27 to 1.64), graft ischemic time >3 hours (OR 1.32, 1.16 to 1.51), and the use of cardioplegia (OR 1.17, 1.01 to 1.35) or Celsior (OR 1.21, 1.06 to 1.38) preservative solution were significant predictors of recipient death or retransplantation at 1 year posttransplantation. Male donor sex (OR 0.83, 0.74 to 0.93) and the use of antihypertensive agents (OR 0.88, 0.77 to 1.00) or insulin (OR 0.84, 0.76 to 0.94) were protective from adverse outcomes at 1 year.

Conclusions. These data suggest that donors who are older, female, or have a long projected ischemic time pose greater risk to heart transplant recipients in the short term. Additionally, certain components of donor management protocols, including antihypertensive and insulin administration, may be protective to recipients.

HEART failure affects approximately 6 million people in the United States and poses a significant burden to the health care system [1]. Although heart transplantation is the optimal therapy for the treatment of end-stage heart failure, the number of transplantations performed annually is approximately half the number of active waitlist candidates, representing a persistent shortage of donor organs. There is increasing interest in maximizing the total number of usable donor hearts through liberalization of donor acceptance criteria [2–5].

Several studies to date have evaluated specific donor characteristics, including age [4,6], cause of death [7,8], sex mismatch [9], social risk factors [10,11], medical history [12,13], and hemodynamic support requirements

*Address correspondence to Isaac George, MD, Division of Cardiothoracic Surgery, Columbia University College of Physicians and Surgeons, New York Presbyterian Hospital, 177 Fort Washington Avenue, MHB 7GN-435, New York, NY 10032. E-mail: ig2006@cumc.columbia.edu

Table 1. Recipient Characteristics Stratified by 1-Year Posttransplantation Survival

	Group S	Group NS/R	P Value
Demographics			
Total, n	13,643	1785	—
Age, y (mean ± SD)	52.0 ± 12.6	53.0 ± 13.1	.003
Male, n (%)	10,337 (75.8)	1316 (73.7)	.06
Body mass index, kg/m ² (mean ± SD)	26.9 ± 4.8	27.2 ± 5.0	.01
Ethnicity, n (%)			<.001
White	9557 (70.1)	1191 (66.7)	
Black	2500 (18.3)	402 (22.5)	
Hispanic	1073 (7.9)	128 (7.2)	
Other	513 (3.8)	64 (3.6)	
Blood group, n (%)			.18
A	5684 (41.7%)	725 (40.6)	
B	1964 (14.4)	255 (14.3)	
O	5263 (38.6)	726 (40.7)	
AB	732 (5.4)	79 (4.4)	
Etiology of heart failure, n (%)			<.001
Dilated CM	6257 (45.9)	706 (39.6)	
Ischemic CM	5382 (39.4)	745 (41.7)	
Restrictive CM	322 (2.4)	63 (3.5)	
Congenital heart disease	338 (2.5)	77 (4.3)	
Other	1344 (9.9)	194 (10.9)	
Comorbidities, n (%)			
Diabetes	3534 (26.0)	488 (27.5)	.18
Cerebrovascular disease	612 (4.5)	88 (5.0)	.38
Prior cardiac surgery at listing	4727 (36.8)	746 (45.2)	<.001
Hemodynamics at transplantation			
Cardiac output, L/min (mean ± SD)	4.5 ± 1.5	4.5 ± 1.6	.29
Mean pulmonary artery pressure, mm Hg (mean ± SD)	28.4 ± 10.1	29.6 ± 10.2	<.001
Pulmonary capillary wedge pressure, mm Hg (mean ± SD)	19.0 ± 8.8	19.5 ± 8.6	.02
Clinical status at transplantation, n (%)			
Intubated	257 (1.9)	126 (7.1)	<.001
Inotropic support	5574 (40.9)	724 (40.6)	.81
Intra-aortic balloon pump	686 (5.0)	115 (6.4)	.01
Left ventricular assist device	3141 (23.0)	468 (26.2)	.003
Extracorporeal membrane oxygenation	64 (0.5)	56 (3.1)	<.001

Abbreviation: CM, cardiomyopathy.

[14,15], and their impact on posttransplantation recipient survival. However, many of these studies were single-center reports with small sample sizes and evaluated only a limited number of donor variables. Therefore, the aim of this study was to utilize the United Network for Organ Sharing (UNOS) Standard Transplant Analysis and Research (STAR) database in order to evaluate a broad number of donor characteristics and their impact on the short-term survival of patients undergoing cardiac transplantation. Insight from this analysis may help to refine the criteria for high-risk donors, thereby enhancing our ability to maximize the donor pool, as well as to obtain useful information on beneficial donor management practices.

METHODS

Data Source

All data used in the analysis were provided by UNOS through the STAR database. The database is a deidentified, patient-level

data source that contains donor, waitlist, and transplant recipient variables derived from UNet forms for any transplant in the United States after October 1, 1987. Data were provided by UNOS through June 6, 2014. The Columbia University Institutional Review Board reviewed the current study, and an exemption was granted for approval given the deidentified nature of the dataset.

Study Design

All adult (≥ 18 years) heart transplant recipients undergoing transplantation between July 1, 2004, and December 31, 2012, were reviewed for inclusion in the study ($n = 16,037$). Patients who were lost to follow-up within 1 year posttransplantation were excluded from the study ($n = 609$). Remaining patients were stratified by their status 1 year after transplantation; patients who were alive at 1 year (group S, $n = 13,643$) and patients who died or underwent cardiac retransplantation by the 1-year follow-up (group NS/R = 1785). Mean follow-up time for the entire cohort was 3.9 ± 2.6 years.

Recipient variables collected included baseline demographics, heart failure etiology, comorbidities, and clinical status at

Download English Version:

<https://daneshyari.com/en/article/4255850>

Download Persian Version:

<https://daneshyari.com/article/4255850>

[Daneshyari.com](https://daneshyari.com)