Orthotopic Heart Transplantation In The Diabetic Patient, Are We Still Worried? A Review Of 852 Consecutive Patients

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Abstract

Background: Diabetes is common in heart failure patients and almost a quarter of heart transplant (HTx) recipients are diabetic at 1 year post transplant. The effect of diabetes on transplant outcomes is conflicting. The goal of this study was to examine the impact of diabetes on post-transplant outcomes at a large single center.

Methods: We divided 852 patients at our center transplanted from 2010 to 2018 into those with (n = 274) and without pre-transplant diabetes (n = 578). The diabetic patients were further divided: tight glucose control (HbA1c <5.9. n= 17) and relaxed glucose control (HbA1c >7.0; n = 23) Demographic data and outcomes, including 1-year survival, freedom from cardiac allograft vasculopathy (CAV), freedom from non-fatal major adverse cardiac events (NF-MACE: myocardial infarction, new congestive heart failure, percutaneous coronary intervention, pacemaker/ICD placement, stroke), freedom from rejection (Any treated rejection (ATR), acute cellular rejection (ACR), antibody-mediated rejection (AMR)), freedom from dialysis, and freedom from infection, were compared between groups.

Results: There was no significant difference between groups in 1-year survival, freedom from cardiac allograft vasculopathy, non-fatal major cardiac events, rejection, new-onset dialysis, or infection. There was a numerical difference towards worse 1-year survival in the relaxed glucose control group compared with the tight control group (82.6 v 94.1%; p=0.35). There was no difference in other outcomes between groups.

Conclusion: While pre-transplant diabetes is often considered an important factor in selecting appropriate heart transplant candidates, this large single-center analysis does not demonstrate an association between pre-transplant diabetes and post-transplant outcomes, regardless of the adequacy of glucose control.

Background

- Diabetes is common in heart failure patients and almost a quarter of heart transplant (HTx) recipients are diabetic at 1 year post transplant.
- The effect of diabetes on transplant outcomes is conflicting. The goal of this study was to examine the impact of diabetes on post-transplant outcomes at a large single center.

Purpose

- To assess the impact of diabetes on post-heart transplant outcomes

Demographics

Demographics	Pre-Transplant Diabetes (n=274)	No Pre-Transplant Diabetes (n=578)	P-value
Mean Recipient Age, Years ± SD	58.5 ± 9.2	54.0 ± 13.8	**<0.001**
Mean Donor Age, Years ± SD	36.7 ± 13.2	34.9 ± 12.7	0.055
Body Mass Index, Mean ± SD	26.3 ± 4.6	24.6 ± 4.5	**<0.001**
Female (%)	28.8%	29.8%	0.810
Previous Pregnancy in Females (%)	79.7%	70.5%	0.166
Ischemic Time, Mean Mins ± SD	174.8 ± 52.4	171.0 ± 53.7	0.340
Primary Reason For Transplant, Underlying Diagnosis of CAD (%)	43.8%	27.2%	**<0.001**
Status 1 at Transplant (%)	85.3%	81.4%	0.175
Cytomegalovirus Mismatch (%)	17.9%	24.9%	**0.027**
Treated Hypertension (%)	67.3%	48.0%	**<0.001**
Insertion of Mechanical Circulatory Support Device (%)	32.6%	25.9%	0.050
Prior Blood Transfusion (%)	43.8%	38.0%	0.111
Pre-Transplant PRA ≥ 10% (%)	29.5%	32.2%	0.475
Pre-Transplant Creatinine, Mean ± SD	1.7 ± 1.1	1.4 ± 1.1	**0.007**
ATG Induction Therapy (%)	59.0%	50.3%	**0.019**

Methods

- We divided 952 patients at our center transplanted from 2010 to 2018 into those with (n = 274) and without pre-transplant diabetes (n = 578).
- The diabetic patients were further divided: tight glucose control (HbA1c <5.9. n= 17) and relaxed glucose control (HbA1c >7.0; n = 23)
- Demographic data and outcomes were compared between groups.
- Endpoints at 1-year included:
  - Survival
  - Freedom from cardiac allograft vasculopathy (CAV)
  - Freedom from non-fatal major adverse cardiac events (NF-MACE: myocardial infarction, new congestive heart failure, percutaneous coronary intervention, pacemaker/ICD placement, stroke)
  - Freedom from rejection (Any treated rejection (ATR), acute cellular rejection (ACR), antibody-mediated rejection (AMR))
  - Freedom from dialysis
  - Freedom from infection

Outcomes

Endpoints	Pre-Transplant Diabetes (n=274)	No Pre-Transplant Diabetes (n=578)	P-value
1-Year Survival	90.9%	91.3%	0.879
1-Year Freedom from CAV	95.6%	94.8%	0.589
1-Year Freedom from NF-MACE	86.1%	87.9%	0.462
1-Year Freedom from ATR	87.5%	84.8%	0.254
1-Year Freedom from ACR	95.6%	92.6%	0.082
1-Year Freedom from AMR	94.1%	95.0%	0.619
1-Year Freedom from Dialysis	81.0%	84.3%	0.245
1-Year Freedom from Infection	32.4%	38.2%	0.095

Endpoints	Tight Glucose Control (n=17)	Relaxed Glucose Control (n=23)	P-value
1-Year Survival	94.1%	82.6%	0.348
1-Year Freedom from CAV	94.1%	95.7%	0.813
1-Year Freedom from NF-MACE	88.2%	82.6%	0.665
1-Year Freedom from ATR	82.4%	82.6%	0.976
1-Year Freedom from ACR	88.2%	95.7%	0.434
1-Year Freedom from AMR	94.1%	91.3%	0.792
1-Year Freedom from Dialysis	70.6%	87.0%	0.129
1-Year Freedom from Infection	23.5%	34.8%	0.185

Results Summary

- There was no significant difference between groups in 1-year survival, freedom from cardiac allograft vasculopathy, non-fatal major cardiac events, rejection, new-onset dialysis, or infection.
- There was a numerical difference towards worse 1-year survival in the relaxed glucose control group compared with the tight control group (82.6 v 94.1%; p=0.35).
- There was no difference in other outcomes between groups.

Conclusion

- While pre-transplant diabetes is often considered an important factor in selecting appropriate heart transplant candidates, this large single-center analysis does not demonstrate an association between pre-transplant diabetes and post-transplant outcomes, regardless of the adequacy of glucose control.

Author Disclosures

F Esmailian has received research grants from TransMedics Inc and is a consultant for Biom Up SA. A Trento has received research grants from Edwards Lifesciences Corporation. D Ramzy has received honoraria from Abiomed, Cardiac Assist Inc, Medronic Vascular Inc, and Zoll Services LLC and is a consultant/speaker for Abbott Laboratories, Baxter Healthcare, and Intuitive Surgical Inc. J Kobashigawa has received research grants and/or honoraria from CareDx, Inc., Sanofi-Genzyme, CSL-Behringer and One Lambda Inc. and is part of the advisory committee for TransMedics. D Emerson, D Megna, R Cole, R Levine, and J Chikwe have no financial relationships to disclose.