



Smidt Heart Institute

The Forgotten Hepatitis B Donor in Heart Transplantation

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Abstract

Background: In the past, Hepatitis B donors have been declined in patients who have not been vaccinated by the Hepatitis B vaccine. There is concern that these donors would transmit Hepatitis B to the recipient if they are not vaccinated. There is treatment available for these Hepatitis B infections, however, it has not been established as to its efficacy in patients on immunosuppression. In addition, hepatitis viruses have been reported to affect the endothelium of vital organs. Hepatitis B may injure the endothelium of the coronary vascular tree and could potentially result in a greater development of cardiac allograft vasculopathy (CAV) after heart transplantation. Therefore, we sought to assess this possibility by examining our patients who received Hepatitis B donors.

Methods: Between 2010 and 2016 we assessed 24 heart transplant patients who received a Hepatitis B donor. All of the recipients had received a Hepatitis B vaccine prior to transplantation. Endpoints include 3-year survival, 3-year freedom from CAV, 3-year freedom from non-fatal major adverse cardiac events (NF-MACE), and freedom from first year rejection, including any treated rejection, acute cellular rejection (ACR), and antibody-mediated rejection (AMR). These study patients were compared with 600 patients without Hepatitis B donors in a contemporaneous era.

Results: 3-year survival, freedom from NF-MACE, and freedom from first year rejection were similar between the Hepatitis B and Control groups. There is numerically a lower incidence of freedom from CAV in the Hepatitis B group compared to the control, but this was not statistically significant.

Conclusion: Hepatitis B donors appear to have acceptable outcome compared to non-Hepatitis B donors after heart transplantation. Larger numbers of Hepatitis B donors will be needed to assess risk for increased CAV development.

Background

- In the past, Hepatitis B donors have been declined in patients who have not been vaccinated by the Hepatitis B vaccine.
- There is concern that these donors would transmit Hepatitis B to the recipient if they are not vaccinated.
- There is treatment available for these Hepatitis B infections, however, it has not been established as to its efficacy in patients on immunosuppression.
- In addition, hepatitis viruses have been reported to affect the endothelium of vital organs.
- Hepatitis B may injure the endothelium of the coronary vascular tree and could potentially result in a greater development of cardiac allograft vasculopathy (CAV) after heart transplantation.

Purpose

To assess the possible effect of the Hepatitis B virus on heart transplant outcomes by examining our patients who received Hepatitis B virus donors.

Methods

- Between 2010 and 2016, we assessed 24 heart transplant patients who received a Hepatitis B donor.
- All of the recipients had received a Hepatitis B vaccine prior to transplantation.
- Endpoints included:
 - 3-year survival
 - 3-year freedom from CAV
 - 3-year freedom from non-fatal major adverse cardiac events (NF-MACE, defined as myocardial infarction, percutaneous coronary intervention/angioplasty, new congestive heart failure, pacemaker/implantable cardioverter-defibrillator placement, and stroke)
 - freedom from first year rejection: any treated rejection, acute cellular rejection (ACR), and antibody-mediated rejection (AMR).
- These study patients were compared with 600 patients without Hepatitis B donors in a contemporaneous era.

Demographics

Demographics	Patients with a Hepatitis B donor (n=24)	Patients without a Hepatitis B donor (n=600)	P-value
Mean Recipient Age, Years $\pm$ SD	61.1 $\pm$ 10.5	54.9 $\pm$ 12.9	0.021
Mean Donor Age, Years $\pm$ SD	47.3 $\pm$ 8.2	35.0 $\pm$ 15.1	<0.001
Body Mass Index, Mean $\pm$ SD	25.3 $\pm$ 4.4	25.2 $\pm$ 4.7	0.920
Female (%)	16.7%	29.0%	0.251
Ischemic Time, Mean Mins $\pm$ SD	178.2 $\pm$ 55.3	173.1 $\pm$ 55.3	0.658
Primary Reason For Transplant, Underlying Diagnosis of CAD (%)	37.5%	35.6%	0.831
Status 1 at Transplant (%)	45.8%	82.0%	<0.001
Cytomegalovirus Mismatch (%)	41.7%	21.3%	0.025
Diabetes Mellitus (%)	33.3%	30.5%	0.822
Treated Hypertension (%)	70.8%	53.7%	0.142
Insertion of Mechanical Circulatory Support Device (%)	16.7%	28.0%	0.350
Pre-Transplant PRA $\geq$ 10% (%)	20.8%	30.9%	0.380
Pre-Transplant Creatinine, Mean $\pm$ SD	1.28 $\pm$ 0.4	1.52 $\pm$ 1.2	0.373

Outcomes

Endpoints	Patients with a Hepatitis B donor (n=24)	Patients without a Hepatitis B donor (n=600)	P-value
3-Year Survival	87.5%	86.7%	0.941
3-Year Freedom from CAV	79.2%	88.2%	0.111
3-Year Freedom from NF-MACE	79.2%	81.8%	0.699
1-Year Freedom from ATR	87.5%	85.2%	0.863
1-Year Freedom from ACR	95.8%	93.3%	0.695
1-Year Freedom from AMR	95.8%	94.7%	0.847

Results Summary

- 3-year survival, freedom from NF-MACE, and freedom from first year rejection were similar between the Hepatitis B and Control groups.
- There is numerically a lower incidence of freedom from CAV in the Hepatitis B group compared to the control, but this was not statistically significant.

Conclusion

- Hepatitis B donors appear to have acceptable outcome compared to non-Hepatitis B donors after heart transplantation.
- Larger numbers of Hepatitis B donors will be needed to assess risk for increased CAV development.

Author Disclosures

J Patel has received research grants from Alexion Pharmaceuticals, Pfizer, Alnylam Pharmaceuticals and Astra Zeneca and is part of the advisory board/speaker bureau for Mallinckrodt Pharmaceuticals, Therakos and Akcea. D Chang has received research grants from Mesoblast, Amgen, and Biocardia and is a stock shareholder of Abbott Laboratories, AbbVie Inc, Repligen, Portola Pharmaceuticals, and Amarin Corp. L Czer has received research grants from St. Jude Medical and Abbott Laboratories. 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. J Kobashigawa has received research grants and/or honoraria from CareDx, Inc., Sanofi-Genzyme, CSL-Behring and One Lambda Inc. and is part of the advisory board for TransMedics. M Kittleson, K Nishihara, A Shen, T Megerdichian, R Zabner, and K Lor have no financial relationships to disclose.