Outcomes with Hepatitis B Co-Infection in Pediatric Renal Transplant Recipients

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Introduction

- Transplantation of any organ requires pre- and post-operative precautions to ensure patient and graft survival and health
- Hepatitis C infection has been shown to lead to acute kidney injury and increased risk of post-transplant complications[1]
- Additional studies have shown complications associated with receiving a transplant from a HBV-positive or HCV-positive donor in adults but data in children are lacking[2-3]

Objective

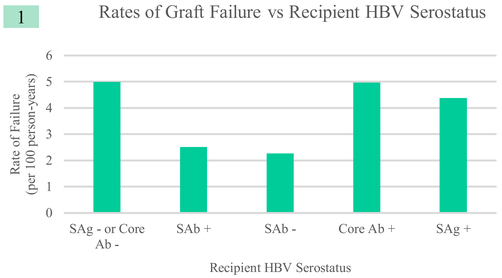
- Investigate if various HBV serostatus markers are associated with differences in graft survival in pediatric renal transplant recipients

Methods

- Retrospective cohort study
- Data was acquired from the Organ Procurement and Transplant Network (OPTN) for pediatric (<18 years) patients who received a primary, renal-only transplant
- HBV infections measured in the following 3 ways:
  - HBV Surface Antigen Test (SAg) +: patient is currently infected
  - HBV Core Test (Core Ab) +: patient has ever been infected or has current chronic infection
  - HBV Surface Antibody Test (SAb) +: patient has cleared the virus or been vaccinated
- Kaplan-Meier plots computed using:
  - Time variable: graft survival in years (time to graft failure, patient death, or last follow-up date, whichever is earliest)
  - Status variable: graft status (failed vs. did not fail)
  - Factor variables: HBV serostatus variables for recipients and donors
- Rates expressed as number of failures per 100 person-years of follow-up

Results

1



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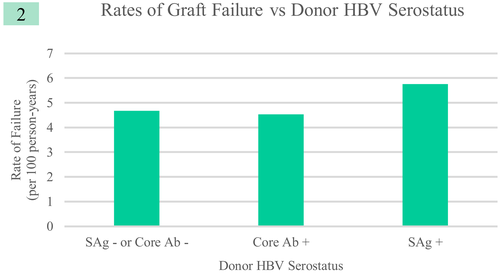

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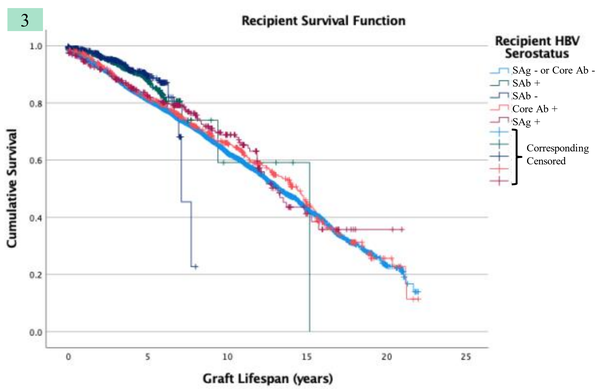

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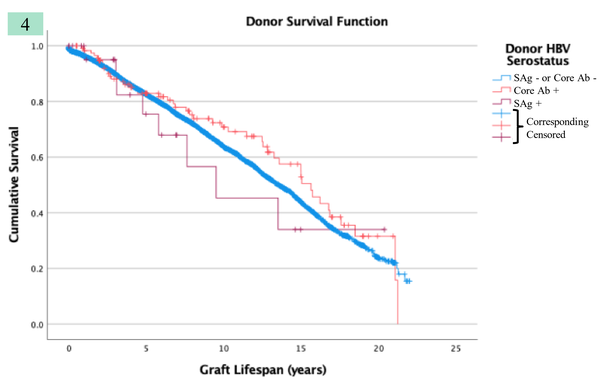

1

		Donor			TOTAL
		SAg - or Core Ab -	Core Ab +	SAg +	
Recipient	SAg - or Core Ab -	7098	73	13	7184
	SAb +	2531	13	4	2548
	SAb -	945	6	2	953
	Core Ab +	535	18	2	555
	SAg +	293	5	3	301
TOTAL		11402	115	24	11541

2

		DID NOT FAIL	FAILED	TOTAL
Recipient HBV Serostatus	SAg - or Core Ab -	4478 (60.9%)	2880 (39.1%)	7358
	SAb +	2388 (93.4%)	169 (6.6%)	2557
	SAb -	896 (93.4%)	63 (6.6%)	959
	Core Ab +	336 (59.1%)	233 (40.9%)	569
	SAg +	219 (60.7%)	95 (30.3%)	314
TOTAL		8317 (70.7%)	3440 (29.3%)	11757

3

		DID NOT FAIL	FAILED	TOTAL
Donor HBV Serostatus	SAg - or Core Ab -	8389 (70.5%)	3516 (29.5%)	11905
	Core Ab +	74 (61.7%)	46 (38.3%)	120
	SAg +	17 (68.0%)	8 (32.0%)	25
TOTAL		8480 (70.4%)	3570 (29.6%)	12050

Summary

- Our analysis is the first of its kind to investigate HBV serostatus and its potential impact on kidney transplant outcomes in pediatric recipients
- Recipients with (SAb +) or (SAb -) had lower rates of failure compared to those with (SAg +), (Core Ab +), or (SAg - or Core Ab -)
- Recipients of donors with (SAg +) had higher rates of failure compared to those with (Core Ab +) or (SAg - or Core Ab -)
- These results are also supported by the Kaplan-Meier Curves for recipients and donors, respectively

Conclusions

- Our data supports the hypothesis that having a donor with a positive SAg will increase the rate of graft failure
- Unexpectedly, a recipient with a positive Surface Ag at the time of transplant did not yield the highest rate of failure when compared to the other recipient HBV serostatuses. Additionally, having a positive SAb was not a protective factor in rate of graft failure, compared to those with a negative SAb.
- Potential future studies:
  - Further analyze these survival models and investigate the causes of individual graft failures
  - Compare the multiple combinations of HBV serostatus of donors and recipients amongst each other
  - Investigate contraction of HBV post-transplant outcomes
    - Intake and follow-up data from this source is not currently thorough enough to definitively determine if the patients that are negative at the time of transplant are also receiving grafts from donors that are negative

References

1. Barsoum RS, William EA, Khalil SS. Hepatitis C and kidney disease: A narrative review. J Adv Res 2017;8(2):113–30.
2. Singh N, Neidlinger N, Djamali A, et al. The impact of hepatitis C virus donor and recipient status on long-term kidney transplant outcomes: University of Wisconsin experience. Clin Transplant 2012;26(5):684–93.
3. Fabrizi F, Martin P, Dixit V, Bunnapradist S, Kanwal F, Dulai G. Post-transplant diabetes mellitus and HCV seropositive status after renal transplantation: meta-analysis of clinical studies. Am J Transplant 2005;5(10):2433–40.