Impact of a Pharmacist-Led Vaccine Recommendation Program for Pediatric Kidney Transplant Candidates

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Abstract - Updated

Introduction: Previous studies have shown that a significant proportion of pediatric transplant recipients have incomplete age-specific vaccination schedules at the time of transplantation. Currently, no published studies have described the role of a transplant pharmacist in improving immunization rates for this vulnerable population.

Rationale: The goal of this analysis was to evaluate the impact of transplant pharmacist interventions on the completion rate of vaccination schedules at the time of transplant.

Methods: A single-center, retrospective study was conducted for pediatric kidney transplant recipients with available vaccine records who underwent transplantation between 1/1/12 and 9/30/15. We compared patients who received pharmacist-led vaccination recommendations prior to transplant (intervention group) to patients without pharmacist recommendations (control group). Intervention included assessment of vaccination status at time of initial evaluation according to the CDC immunization schedule and provision of recommendations for a vaccination catch-up schedule.

Results: Forty-seven pediatric patients were included. The intervention and control groups included 24 and 23 patients, respectively. Overall, the median age was 13 (range 1-18) years at transplant and a majority were Hispanic (60%), female (53%), and recipients of a deceased donor transplant (89%). Baseline characteristics were similar between groups. The median percentage of up-to-date vaccinations at the time of transplant was significantly higher in the intervention group (91%; IQR 86-100%) vs. the control group (80%; IQR 71-80%) [$p < 0.0001$]. The median change in up-to-date vaccinations from time of evaluation to time of transplant was also significantly higher in the intervention group (7.5%) compared to the control group (0%) [$p < 0.0001$]. No patients were readmitted for a vaccine-preventable disease within 6 months post-transplant; two patients were readmitted for treatment of acute allograft rejection, both in the intervention group.

Conclusion: In this cohort, not all patients were fully immunized at the time of evaluation; however, with pharmacist intervention, significantly more patients were up-to-date with vaccination schedules at the time of transplant. These results suggest that a transplant pharmacist may serve as a valuable resource to increase immunization schedule compliance between time of evaluation and transplantation.

Background

- Immunocompromised patients are at an increased risk for vaccine-preventable disease
- Efforts should be made to vaccinate prior to transplant
- Previous studies in pediatric pre-transplant candidates demonstrate sub-optimal immunization rates
- No published study to date describes the potential role of transplant pharmacists in immunization management

Purpose

Evaluate the impact of transplant pharmacist interventions on the completion rate of vaccination schedules at the time of transplant

Methods

Design
- Retrospective, single-center chart review

Inclusion Criteria
- Kidney transplant recipient
- ≤18 years of age at time of transplant
- Transplanted between 01/2012 – 09/2015

Exclusion Criteria
- Not transplanted at University Health System
- No vaccine records available at time of transplant

Comparison Groups
Intervention
- Documented transplant pharmacist vaccination recommendations prior to transplant

Control
- No documented transplant pharmacist vaccination recommendations

Outcomes
Primary
- Percentage of appropriate vaccines completed at time of transplant

Secondary
- Percent change in vaccines completed from time of evaluation to time of transplant
- Six-month readmission rates for vaccine-preventable disease or allograft rejection

Results

Baseline Characteristics

Variable	Intervention (n = 24)	Control (n = 23)	P-value
Age at Transplant (Years), Median [IQR]	14 [4-17]	12 [7-16]	0.62
Gender (Female), n (%)	15 (62)	10 (43)	0.25
Ethnicity, n (%)			
Black	4 (17)	3 (13)	1.00
Hispanic	16 (66)	12 (52)	0.38
White	4 (17)	8 (35)	0.19
Type of Transplant, n (%)			
Deceased Donor	20 (83)	22 (96)	0.35
Living Related Donor	-	1 (4)	0.49
Living Unrelated Donor	4 (17)	-	0.11
Medicaid Funded, n (%)	16 (67)	18 (78)	0.52
Panel Reactive Antibody %, Median [IQR]	0 [0-25]	0 [0-13]	0.63
Induction Therapy, n (%)			
Basiliximab	19 (79)	19 (83)	1.00
Rabbit Antithymocyte Globulin	5 (21)	4 (17)	1.00

[IQR] = Interquartile Range

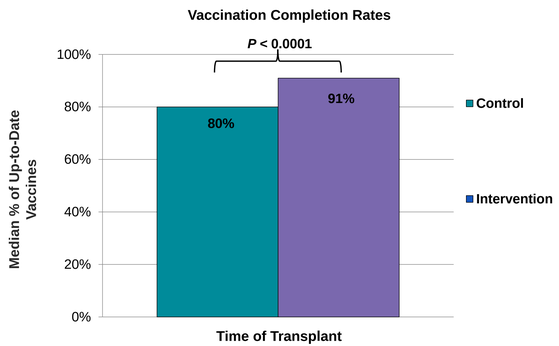
Results (Continued)

Baseline Characteristics

Variable	Intervention (n = 24)	Control (n = 23)	P-value
Indication for Transplant, n (%)			
Focal Segmental Glomerulosclerosis	2 (8)	1 (4)	1.00
Dysplasia	6 (25)	6 (27)	1.00
Obstructive Uropathy	1 (4)	3 (13)	0.35
Reflux Nephropathy	-	3 (13)	0.11
Systemic Lupus Erythematosus Nephritis	-	2 (9)	0.23
Hemolytic Uremic Syndrome	1 (4)	1 (4)	1.00
Chronic Glomerulonephritis	7 (30)	2 (9)	0.14
Polycystic Kidney Disease	1 (4)	1 (4)	1.00
Congenital Nephrotic Syndrome	1 (4)	1 (4)	1.00
Prune Belly	-	1 (4)	0.49
Other	5 (21)	2 (9)	0.42
Time from Evaluation to Listing (Days), Median [IQR]	77 (39-162)	76 (32-117)	0.63
Time from Listing to Transplant (Days), Median [IQR]	98 (37-165)	50 (21-128)	0.38
Time from Evaluation to Transplant (Days), Median [IQR]	220 (94-322)	132 (97-237)	0.19

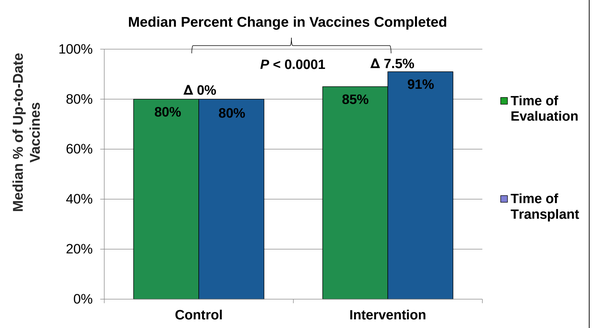
[IQR] = Interquartile Range

Primary Outcome



Results (Continued)

Secondary Outcomes



Outcome	Intervention (n = 24)	Control (n = 23)	P-value
6-Month Readmissions, n (%)	17 (71)	7 (30)	0.0087
Vaccine-Preventable Disease	0	0	-
Rejection	2 (8)	0	0.49
Antibody-mediated	0	0	-
Acute Cellular	2 (8)	0	0.49

Discussion

Limitations
- Perceptions of human papillomavirus vaccine in males
- Accuracy of vaccination records and documentation at time of evaluation
- Discretion of primary care physician to accept recommendations

Conclusions
- Not all patients were fully immunized at time of transplant evaluation
- Pharmacist intervention led to improved up-to-date vaccination schedules at transplant
- Transplant pharmacists may serve as valuable resources to increase immunization schedule compliance

References

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Authors have no conflicts of interest

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