Decreasing Perioperative Antibiotic Prophylaxis Duration in Liver Transplant Recipients

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Background

- Liver transplant recipients (LTRs) are at high risk for perioperative infections[1]
- The optimal duration of perioperative antibacterial prophylaxis for LTRs remains unclear, particularly in high risk patients hospitalized prior to transplant[2]
- Our study examines the impact of a change in our institutional perioperative antibiotic protocol in LTRs on post-transplant infection and antibiotic-associated adverse effects

Perioperative antibiotic prophylaxis protocol change

Low risk patients (hospitalized <24 hours prior to transplant)

Post-op duration 48 hours → **1/19/21** → Post-op duration 24 hours

High risk patients (hospitalized ≥24 hours prior to transplant)

Post-op duration 5 days or duration of post-op ICU stay → Post-op duration 72 hours

- Antibiotic choice: Piperacillin-tazobactam, vancomycin added if high risk

Methods

- Retrospective cohort study of all adult LTRs at our center who underwent transplant from 1/1/2018 until 9/1/2021
  - Pre-protocol change cohort: 1/1/2018-1/19/2021
  - Post-protocol change cohort: 1/20/2021-1/1/2022
- Chart review to determine duration of perioperative antibiotics
- Outcomes:
  - Post-transplant infection within 30 days
    - Composite outcome of bacteremia and surgical site infection (SSI)
  - Acute kidney injury (AKI)
  - *C. difficile* infection (CDI)
  - Isolation of multi-drug resistant organisms (MDROs) from any site

Results

Table 1. Demographics

	All n=154 (%)	**Pre** n=123 (%)	**Post** n=31 (%)
Age groups			
18-44	34 (22)	25 (20)	9 (29)
45-64	86 (56)	69 (56)	17 (55)
>65	34 (22)	29 (24)	5 (16)
Gender			
Male	100 (65)	82 (67)	18 (58)
Patient defined Race			
White	130 (84)	103 (84)	27 (87)
Asian	2 (1)	2 (2)	0
Black/African-American	1 (1)	0	1 (3)
Other	21 (14)	18 (15)	3 (10)
Ethnicity			
Hispanic	20 (13)	18 (15)	2 (6)
Clinical characteristics			
Previous transplant	7 (5)	4 (3)	3 (10)
MELD score at time of transplant (median)	26	25	31.5
Hours in OR (median)	5.83	5.82	5.85
Diabetes	74 (48)	56 (46)	18 (58)
Beta-lactam allergy	23 (15)	17 (14)	6 (19)
High-risk	63 (41)	43 (35)	20 (65)

Results

Figure 1. Perioperative prophylactic antibiotic duration pre- and post-protocol change

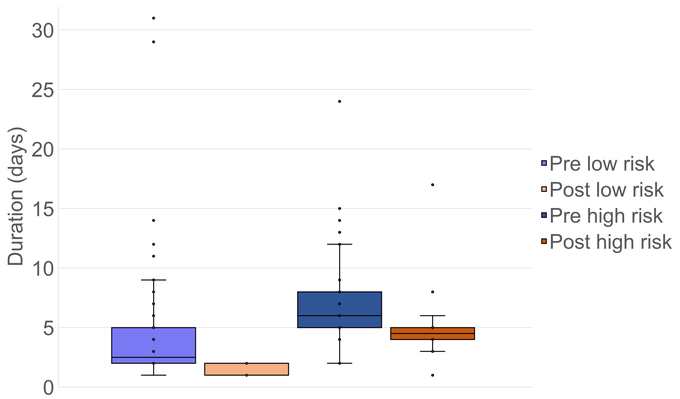


Figure 2. Incidence of post-operative bacteremia or SSI

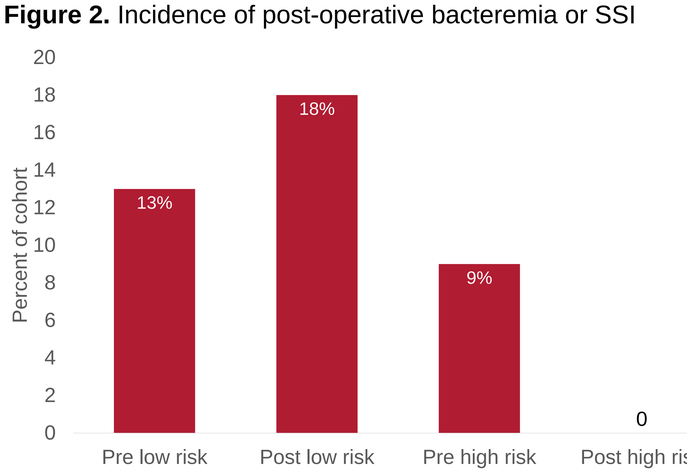


Table 2. Outcomes following protocol change

	Low risk				High risk			
	Pre	Post	OR	p-value	Pre	Post	OR	p-value
n (%)	80	11			43	20		
Bacteremia or SSI	10 (13)	2 (18)	1.55	0.63	4 (9)	0	0	0.3
Bacteremia	8 (10)	1 (9)			2 (5)	0		
Surgical site infection	4 (5)	1 (9)			2 (5)	0		
Infection (composite)	33 (41)	4 (36)	0.82	1	22 (51)	7 (35)	0.51	0.23
Antibiotic change for concern of infection	30 (38)	4 (36)			21 (49)	7 (35)		
Median Hospital LOS	9.19	8.26			21.06	13.37		
Readmission (30-day)	27 (34)	3 (27)	0.74	1	8 (19)	4 (20)	1.09	1

Figure 3. Association (Odds Ratio, OR) between being in post cohort and developing potential antibiotic related adverse effect

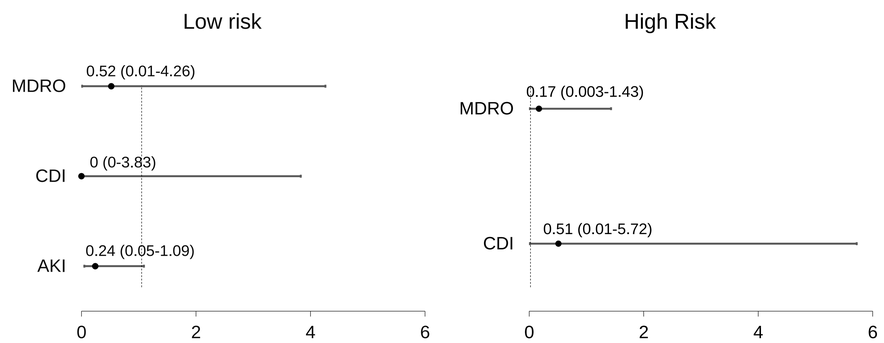
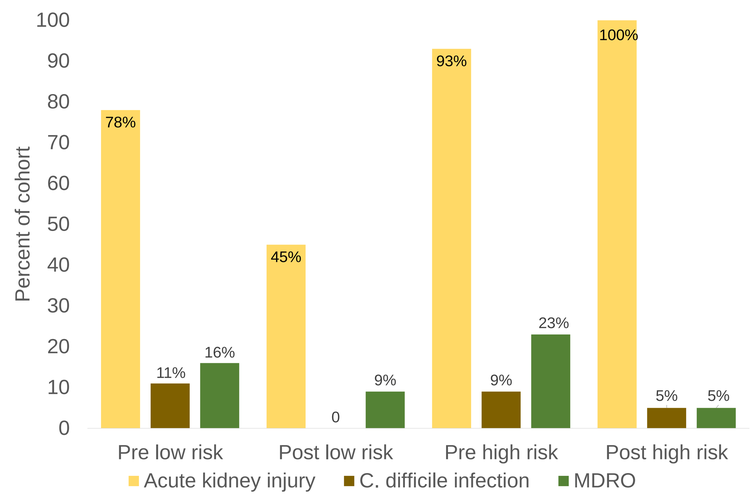


Figure 4. Incidence of antibiotic-associated adverse effects



Conclusions

- Median duration of perioperative antibiotic prophylaxis decreased following the policy change and was not accompanied by an increase in postoperative infection
- There was no significant difference in antibiotic associated adverse effects with the shorter duration protocol
- Many of these patients are exposed to long durations of antibiotics
- Further studies are needed to determine optimal duration of perioperative antibiotic prophylaxis for patients hospitalized ≥24 hours prior to liver transplantation

References:
1. Romero, F. A., & Razonable, R. R. (2011). Infections in liver transplant recipients. World Journal of Hepatology, 3(4), 83–92. https://doi.org/10.4254/wjh.v3.i4.83
2. Anesi JA, Blumberg EA, Abbo LM. Perioperative Antibiotic Prophylaxis to Prevent Surgical Site Infections in Solid Organ Transplantation. *Transplantation*. 2018;102(1):21-34. doi:10.1097/TP.0000000000001848