Cefoxitin vs Piperacillin/Tazobactam for Acute Appendicitis in Pediatric Patients

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Background

- Appendicitis is a condition that often necessitates antimicrobial therapy in pediatric patients.
- There is a lack of consensus regarding the optimal choice of antimicrobial therapy for pediatric appendicitis, with varying recommendations in the Infectious Disease Society of America (IDSA) guidelines and the Pediatric Pharmacy Advocacy Group (PPAG) Red Book.
- Recent studies have shown that narrow-spectrum and broad-spectrum antimicrobials produce similar outcomes in the treatment of pediatric appendicitis.
- Literature Review:
  - The 2015 PPAG Red Book recommends cefoxitin as a treatment of choice for appendectomies in uncomplicated, unperforated and perforated cases.[1]
  - IDSA guidelines recommend piperacillin/tazobactam for extra-biliary complicated intra-abdominal infections in pediatric patients.[2]
  - In 2015, Kronman et.al compared the use of broad-spectrum vs narrower-spectrum antibiotics for surgically managed pediatric appendicitis and concluded that there was no additional advantage in broad-spectrum antimicrobial therapy compared to narrow-spectrum.[3]
  - The 2013 Clinic Practice Guidelines for Antimicrobial Prophylaxis in Surgery recommend a regimen of cefoxitin or cefotetan or cefazolin with metronidazole in pediatric uncomplicated appendicitis.[4]
- Following change in hospital guidelines in September 2015, cefoxitin has supplanted piperacillin/tazobactam for the management of pediatric appendicitis in patients presenting to the pediatric emergency department at Maimonides Medical Center.

Objective

To compare cefoxitin vs piperacillin/tazobactam for surgical prophylaxis and treatment of acute appendicitis in pediatric patients.

Methodology

- This was a retrospective cohort study of surgically managed pediatric patients between the ages of 3 to 18 years with a confirmed diagnosis of appendicitis.
- Patients who received piperacillin/tazobactam from 2014-2015 were compared to patients who received cefoxitin from 2015-2016.
- Data collected included age, gender, race, insurance status, duration of antimicrobial therapy, length of stay, duration of fever and readmission within 30 days of discharge.
- Patients were excluded if they received antimicrobial therapy for other indications or received therapy at another facility prior to transfer to our hospital.

Results

Table 1. Baseline patient characteristics

Characteristics	Piperacillin/tazobactam n=174	Cefoxitin n=141	p-value
Gender			
Female	61	51	0.837
Male	113	90	
Age, yrs			
3-5	16	11	
6-11	103	66	
12-18	55	64	
Avg age, yrs	10.11	11.1	<0.05
Race			
White	86	78	0.356
*Non-White	88	63	

*Hispanic, Black, Asian, Other, Unknown

Chart 1. Readmission within 30 days (p=0.57)

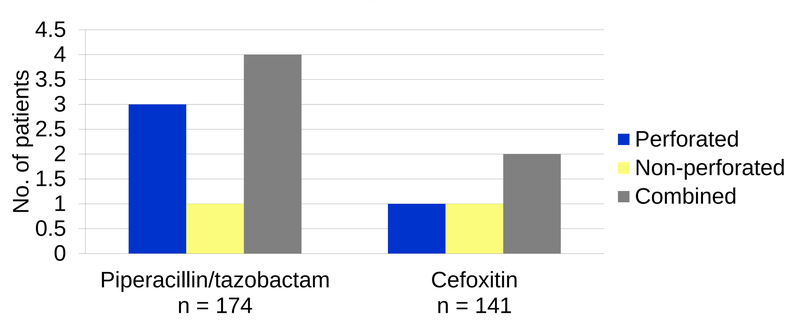

Table 2. Length of stay, days of fever, days of antibiotics

Outcome	Piperacillin/tazobactam n=174	Cefoxitin n=141	p-value
Hospital length of stay, avg days±SD	2.43±2.33	1.8±1.6	<0.005
Days of fever, avg±SD	0.61±1.09	0.48±0.83	0.198
Days of antibiotics, avg±SD	2.4±2.32	1.74±1.58	<0.005

Results – cont.

Table 3. Perforated vs non-perforated

Outcome	Perforated n=51		p-value	Non-perforated n=264		p-value
	Piperacillin/ tazobactam n=31	Cefoxitin n=20	0.486	Piperacillin/ tazobactam n=143	Cefoxitin n=121	0.708
Hospital length of stay, avg days ±SD	6.26±2.03	4.85±2.03	<0.05	1.6±1.35	1.3±0.71	<0.05
Days of fever, avg±SD	1.97±1.43	1.5±1.24	0.221	0.32±0.73	0.31±0.6	0.846
Days of antibiotics, avg±SD	6.23±2.01	4.8±1.96	<0.05	1.57±1.35	1.23±0.68	<0.05

Conclusions

- There was no significant difference in hospital readmission within 30 days and days of fever between the piperacillin/tazobactam and cefoxitin groups.
- Patients treated with cefoxitin had a significant reduction in days of antibiotics and hospital length of stay compared to those who received piperacillin/tazobactam.
  - Secondary analysis of perforated vs nonperforated showed similar results.
- Cefoxitin was found to be non-inferior to piperacillin/tazobactam for the management of pediatric appendicitis at our institution.

References

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4. Bratzler DW, Dellinger EP, Olsen KM, et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. Am J Health Syst Pharm. 2013;70(3):195-283.

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