1149. Reducing Piperacillin/Tazobactam Use in Children with Acute Perforated Appendicitis

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Methods. Single-center, retrospective cohort study of children ≤ 18 years with perforated appendicitis who underwent primary appendectomy. Children with primary nonoperative management or interval appendectomy were excluded. Prior to the intervention, children at our hospital routinely received PT for perforated appendicitis.

Results. A total of 74 children with perforated appendicitis were identified: 23 females and the median age was 8 years (IQR: 5–11.75 years). Post-intervention rate of PT use decreased from 556 DOT per 1000 patient-days to 131 DOT per 1000 patient-days; incidence rate ratio of 0.24 (95% CI: 0.16–0.35), guideline compliance was 84%. PT use decreased from 556 DOT per 1000 patient-days to 131 DOT per 1000 patient-days; incidence rate ratio of 0.24 (95% CI: 0.16–0.35), guideline compliance was 84%. PT use decreased from 556 DOT per 1000 patient-days to 131 DOT per 1000 patient-days; incidence rate ratio of 0.24 (95% CI: 0.16–0.35), guideline compliance was 84%. PT use decreased from 556 DOT per 1000 patient-days to 131 DOT per 1000 patient-days; incidence rate ratio of 0.24 (95% CI: 0.16–0.35), guideline compliance was 84%.

Conclusion. An EHR-integrated ASP intervention targeting children with perforated appendicitis resulted in decreased broad-spectrum antibiotic use with no statistically significant difference in clinical outcomes. Larger, multicenter trials are needed to confirm our findings.

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1150. Evaluating the Impact of Antibiotic Prophylaxis on the Microbiology and Incidence of Ventriculitis in Patients with External Ventricular Drains

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Background. External ventricular drains (EVDs) are frequently used in acute brain injuries for continuous intracranial pressure monitoring and cerebrospinal (CSF) fluid diversion. EVDs are associated with a 0–22% risk of ventriculitis. The evidence for antibiotic prophylaxis (AP) for ventriculitis prevention is not robust. This study aimed to delineate the incidence of EVD-related ventriculitis and causative organisms in patients receiving AP.

Methods. A retrospective chart review from 2013 to 2018 at Yale New Haven Hospital was performed. Patients were included if ≥18 years of age, admitted to the neuroscience intensive care unit (ICU), and had AP with ceftazolin, vancomycin, sulfamethoxazole/trimethoprim, or clindamycin. Patients were excluded if they had a diagnosis of meningitis or ventriculitis prior to EVD placement, on multiple agents, neurosciences intensive care unit (ICU), and had AP with ceftazolin, vancomycin, sulfamethoxazole/trimethoprim, or clindamycin. Patients were excluded if they had a diagnosis of meningitis or ventriculitis prior to EVD placement, on multiple agents.

Results. Five hundred ninety-nine patients were reviewed and 249 patients were included. Baseline demographics are noted in Table 1. Cefazolin was the most common agent for AP (98%). There were 7 cases of ventriculitis with an incidence rate of 2.8% (4 infections per 1000 EVD-days). All of the causative organisms were resistant to the conditions. In an effort to safely decrease broad-spectrum antibiotic use at our hospital, we evaluated the impact of an antimicrobial stewardship program (ASP) intervention on the use of piperacillin/tazobactam (PT) and clinical outcomes in children with perforated appendicitis.

Figure 1. Algorithm for antibiotic selection for acute appendicitis

Figure 2. Oral macrolides, fluoroquinolones, and third generation cephalosporins

Figure 3. Intravenous antibiotics

Table 1. Comparison of characteristics and outcomes, before and after the antimicrobial stewardship intervention

| Characteristics | Pre-intervention, N=23 | Post-intervention, N=51 |
|-----------------|------------------------|-------------------------|
| Sex (female)    | 10 (43%)               | 23 (45%)                |
| Ethnicity (Hispanic) | 15 (65%)               | 24 (47%)                |
| Race            |                        |                         |
| White           | 10 (43%)               | 21 (41%)                |
| Asian           | 2 (9%)                 | 7 (14%)                 |
| Black           | 0 (0%)                 | 1 (2%)                  |
| Other           | 11 (48%)               | 22 (43%)                |
| Age (mean, 95% CI) | 8.5 (6.7–10.3)         | 8.3 (7.1–9.5)           |
| Immuno compromised | 3 (13%)               | 1 (2%)                  |
| Intraoperative findings |          |                         |
| Diffuse purnence | 7 (30%)                | 15 (29%)                |
| Abscesses       | 9 (39%)                | 16 (31%)                |
| Extramedullary  | 1 (4%)                 | 5 (10%)                 |
| Outcomes        |                        |                         |
| Pre-intervention, N=23 | Post-intervention, N=51 |
| Piperacillin/tazobactam days/1000 patient days* | 556 | 131 |
| Length of intravenous antibiotics (mean, 95% CI) in days | 5.6 (4.6–7.1) | 5.4 (4.2–5.9) |
| Total length of antibiotic therapy (mean, 95% CI) in days | 10.7 (9.2–12.1) | 9.8 (8.4–10.6) |
| LOS after surgery (mean, 95% CI), in days | 6.4 (5.2–7.6) | 6.0 (4.9–7.1) |
| Total LOS (mean, 95% CI), in days | 6.6 (5.4–7.7) | 6.4 (5.2–7.6) |
| ED visits/readmissions | 2.6% | 7.14% |
| ED visit | 1% | 2% |
| Readmission | 1% | 2% |
| Surgical Site Infection | 1% | 6.12% |
| ED: emergency department, LOS: length of stay, *=p<0.05 |

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prophylactic agents administered (Table 2). Patients with ventriculitis had a significa-
cantly longer duration of EVD placement (10 ± 3 vs. 7 ± 6 days, P = 0.03), hospital LOS
(30 ± 19 days vs. 15 ± 12, P = 0.04), ICU LOS (22 ± 14 vs. 10 ± 7, P = 0.03). Two patients
with ventriculitis (28%) died within 30 days of admission compared with 46 patients
without ventriculitis (19%, P = 0.53) (Table 3).

Conclusion. The rate of ventriculitis in our study was similar to previous studies
that did not utilize AP. All of the causative organisms were resistant to the prophylactic
agent. Patients who had ventriculitis had a longer duration of EVD placement, hos-
pital LOS, and ICU LOS; however, 30-day mortality was not impacted. Based on our find-
ings, the use of AP to prevent EVD-related ventriculitis should be reconsidered.

Table 1. Demographics

| Demographic Category | Study Group (n=269) |
|----------------------|---------------------|
| Age, mean (years)    | 58 ± 16             |
| Male (%)             | 109 (44)            |
| EVD Duration, median (days) | 6.5 ± 4.0 |
| Duration of Phthalyn, median (days) | 6.7 ± 4.0 |
| Reason for EVD       |                     |
| • Subarachnoid Hemorrhage (%) | 17% ± 6.5 |
| • Tumor (%)          | 19 (7)              |
| • Acute Ischemic Stroke (%) | 7 (3) |
| • Other (%)          | 2 (1)               |
| Antifungal Agent     |                     |
| • Caspofungin (%)    | 3 (1)               |
| • Vancomycin (%)     | 3 (1)               |
| • Clindamycin (%)    | 1 (x)               |
| Overall EVD-Days     | 1227                |
| Ventriculitis Cases (%) | 7 (2.8) |
| Ventriculitis per 1000 EVD-days | 4 |
| Length of Stay, median (days) | 13 ± 12.5 |
| ICU Length of Stay, median (days) | 6.5 ± 4.0 |
| 30-Day Mortality (%) | 48 (19.3)           |

Table 2. Ventriculitis Causative Organisms

| Organism Cultured | Duration of EVD Prior to Positive Culture (days) | Susceptible to Prophylactic Agent (percent) |
|-------------------|-----------------------------------------------|------------------------------------------|
| Acinetobacter baumannii | 6 ± 6 | No |
| Coagulase-negative Staphylococcus | 26 | No |
| Enterobacter cloacae | 12 | No |
| Enterococcus faecalis | 10 | No |
| Klebsiella pneumoniae | 6 | No |
| Pseudomonas aeruginosa | 13 | No |

Table 3. Secondary Outcomes

| Organism | Ventriculitis (n=27) | No Ventriculitis (n=242) | P-value |
|----------|----------------------|--------------------------|---------|
| Hospital LOS, mean (days) | 30.1 ± 18.9 | 15.2 ± 12.2 | 0.04 |
| ICU LOS, mean (days) | 22.3 ± 13.8 | 10.0 ± 7.3 | 0.03 |
| Duration of EVD, mean (days) | 5.9 ± 3.1 | 6.8 ± 5.0 | 0.03 |
| 30-Day Mortality (%) | 2 (7.7%) | 48 (19.5%) | 0.33 |

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1151. Comparison of Periurethral Cleaning Between Normal Saline and Savlon Solutions Before Indwelling Urinary Catheterization in Reducing Cather-
Associated Bacteriuria: A Randomized Controlled Study
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Session: 141. HAI, Device-Associated: CAUTI
Friday, October 4, 2019: 12:15 PM

Background. Cather-associated urinary tract infections (CAUTIs) are one of the
most common nosocomial infections. To date, there have been no randomized con-
trolled trials to recommend the most appropriate antiseptic solution for periurethra-
cleaning before indwelling urinary catheterization. This study was aimed to compare
normal saline solution (NSS) and Savlon solution for periurethral cleaning before
indwelling urinary catheterization in reducing catheter-associated bacteriuria.

Methods. A randomized controlled, noninferiority, cross-over study to deter-
mine the incidence of significant bacteriuria (SB) on day 5 after Foley catheterization,
using 2 different solutions for periurethral cleaning (NSS and Savlon solutions), was
carried out in all adult patients admitted in the 2 medical intensive care units (ICUs), 1
surgical ICU, 2 neurosurgical ICUs, 4 medical wards, 4 surgical wards and 1 emergency
room (ER) of King Chulalongkorn Memorial Hospital, Thailand, from June 2018 to
March 2019. The acceptable prespecified noninferiority margin was set to be 10%. Each
solution was used alternately every 3 months in each unit. Urine culture was collected
on day 5 and 5 after Foley catheterization.

Results. During the study period, there were 207 and 160 patients in the NSS
and Savlon groups, respectively. 202 (55%) patients had received Foley catheterization
in the emergency room. There were no significant differences in the indication, the
current illness, and preexisting condition between the 2 groups. The overall incidence
of SB on day 3 and 5 after catheterization was 4% and 8.2%. The incidence of CAUTI
was 3.43/1,000 catheter-day. The median duration of catheterization was 5 (IQR 3, 7)
days. On day 5 after catheterization, noninferiority was demonstrated for the incidence
of SB with an adjusted difference of 4 (95% CI of the difference: −2.1% to 8.9%, P =
0.05). Regarding the incidence of CAUTI, there was no significant difference between
the 2 groups.

Conclusion. To the best of our knowledge, this study was the first randomized
controlled study to compare the 2 solutions for periurethral cleaning before indwelling
urinary catheterization in different departments. This study demonstrates the noninfe-
riority of NSS to Savlon solution in reducing the incidence of SB.

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1152. Implementation of Enhanced Data Surveillance Methods to Reduce Cather-Associated Urinary Tract Infections
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Background. Urinary tract infections (UTIs) continue to be one of the most
common types of healthcare-associated infections (HAIs). Instrumentation of the
urinary tract using devices such as indwelling urinary catheters (IUCs) is the leading
cause of healthcare-associated UTIs. Every day that a patient has an IUC increases
their risk of acquiring a UTI. After an increase in the number of catheter-associated
urinary tract infections (CAUTIs), a mid-sized acute care hospital in the Northeast
United States used an electronic surveillance system to monitor IUC order compliance
and appropriateness in order to reduce IUC utilization and prevent CAUTIs.

Methods. Using an Infection Prevention (IP) electronic surveillance system, a
line list was generated of patients who had an IUC documented in the urinary flow
sheet of their electronic medical record. This list contained variables such as: catheter
insert date, catheter order status, and catheter indication. IP staff sent this list in a daily
e-mail to clinical leadership and front line staff over a 14 month period. The e-mail
notified providers when their patients had an IUC without an order. Clinical staff was
directed to discontinue the IUC if it was no longer indicated or to place a new IUC
order if still indicated. The National Healthcare Safety Network (NHSN) CAUTI defin-
tion and data functions were used for the purposes of this study.

Results. A statistically significant (P = 0.017) reduction in the hospital CAUTI
rate was found when a comparison was made between the 14-month pre-intervention
baseline period (1.12 CAUTI per 1,000 catheter days) and the 14 month post-interven-
tion period (0.29 CAUTI per 1,000 catheter days). A statistically significant decrease
(4.00%)(0.004) in IUC utilization was also noted for the same time period, decreasing
from 8.2 catheters per 100 patient-days to 7.8 catheters per 100 patient-days.

Conclusion. A significant reduction in CAUTIs and IUC utilization was seen over
the 14-month IP-driven e-mail intervention. This study suggests that regular electronic
communication of surveillance system information to providers may reduce CAUTIs.

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1153. National Trend of Urinary Catheter Device Utilization by Hospital Type,
National Healthcare Safety Network (2015–2019)
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Session: 141. HAI, Device-Associated: CAUTI
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Background. Reducing unnecessary urinary catheter use and optimizing inser-
tion techniques and catheter maintenance and care practices are the most important
urinary tract infection (CAUTI) prevention strategies. To monitor device use (DU)
as quality improvement activity, the Centers for Disease Control and Prevention's