Disclosures. All authors: No reported disclosures.

1458. Burden of Illness in Patients with Urinary Tract Infections With or Without Bacteremia Caused by Carbapenem-Resistant Gram-Negative Pathogens in US Hospitals (2014 to 2018)
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Session: 157. Urinary Tract Infections
Friday, October 4, 2019: 12:15 PM

Background. Urinary tract infections (UTIs) are the most frequent infections caused by Gram-negative (GN) bacteria in the USA. We aimed to characterize the burden of UTIs caused by carbapenem-resistant (CR) or -susceptible (CS) GN in hospitalized patients with or without bacteremia.

Methods. Data from the Premier Healthcare Database of adult patients hospitalized between January 1, 2014 and June 30, 2018 with UTIs (defined as positive urine culture and receipt of GN antibiotics within −2 to 3 days of the index urine culture) with bacteremia (defined as positive blood culture with the same pathogen from the urine) or without bacteremia caused by CR or CS GN were analyzed retrospectively. Stenotrophomonas maltophilia were presumed to be CR but rarely tested. Patient characteristics and outcomes (mortality, different types of length of hospital stay [LOS], ICU admission, discharge status and hospitalization charges) were compared.

Results. A total of 46,076 UTI patients were included. 11,212 patients with bacteremia were significantly more likely to have UTI index culture on the day of the admission vs. 34,864 patients without bacteremia (82.0% vs. 65.9%, P < 0.001, respectively). The same results were seen when stratified by CR status (CR, 68.59% vs. 61.23%, P < 0.047; CS: 82.29% vs. 66.19%, P < 0.001, respectively). UTI patients with bacteremia were also more likely to have a positive blood culture for the same pathogen on the same day of index urine culture (CR: 85.86%; CS: 95.45%). Pseudomonas aeruginosa was the most frequent CR pathogen (50.03%), followed by K. pneumoniae (14.28%) and Stenotrophomonas maltophilia (10.76%), and CR patients with bacteremia were more likely to die in the hospital and less likely to be discharged home than other groups. They also had longer median overall and infection-associated LOS, were more likely to be admitted to the ICU and had higher hospitalization charges (table).

Conclusion. UTIs complicated by bacteremia exacerbates the burden of illness in patients hospitalized with UTIs, increasing mortality, LOS, and hospitalization charges. The presence of CR pathogens further exacerbates this burden.

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1459. Oral Cephalosporins vs. Fluoroquinolones for the Empiric Treatment of Acute Uncomplicated Pyelonephritis
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Session: 157. Urinary Tract Infections
Friday, October 4, 2019: 12:15 PM

Background. The Infectious Diseases Society of America guidelines for the treatment of acute uncomplicated pyelonephritis (AUP) recommend oral fluoroquinolones (FQs) as a first-line agent in patients not requiring hospitalization. However, with increasing rates of FQ and trimethoprim/sulfamethoxazole resistance, oral β-lactams are attractive agents due to improved empiric susceptibility patterns at our institution. The current guideline advises caution when using oral β-lactams due to concern for inferior efficacy, but studies specifically evaluating the efficacy of oral cephalosporins (CPSs) in AUP are limited. The purpose of this study was to provide additional evidence for the safe and effective use of oral CPSs for empiric treatment of AUP.

Methods. Retrospective chart review was performed on all patients prescribed oral CPSs or FQs for AUP from the Emergency Department (ED) at Parkland Memorial Hospital between September 2017 and July 2018. The primary endpoint was treatment failure within 30 days, defined as ED return due to any cause or modification to an alternative antibiotic. Secondary endpoints included ED return within 30 days due to continued symptoms of AUP, documented adverse drug reactions (ADR), and C. difficile infection (CDI) within 30 days.

Results. Of the 333 patients included in the study, treatment failure occurred in 72 (21.6%) patients and was similar between oral FQs and CPSs (21.4% vs. 21.7%). A higher rate of treatment failure was observed for first-generation (1GC) CPSs compared with second-generation (2GC) or third-generation (3GC) CPSs (19/51 [34.3%] vs. 18/107 [16.8%] vs. 9/68 [13.2%]). The primary reason for treatment failure was empirical failure due to resistance for oral 1GC CPSs, whereas FQs, then 2GC and 3GC (19/51 [37.3%] vs. 14/107 [13.1%] vs. 11/97 [10.3%]) vs. 4/68 [5.9%]). Rates of return to the ED for continued symptoms of AUP were found to be lower for oral CPSs (8/226 [3.5%]) vs. FQs (9/107 [8.4%]). Documented ADRs were low (7/83 [1.5%]) and none developed CDI.

Conclusion. Oral CPSs appear to be safe and effective as FQs for the empiric treatment of AUP. In concordance with the susceptibility data of our institutional antibiogram, 2GC and 3GC were observed to have a lower rate of treatment failure compared with 1GC and FQs.

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1460. The Effectiveness of Short vs. Long Antibiotic Therapy in Hospitalized Adult Patients with Urinary Tract Infections: A Systematic Review and Meta-Analysis
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Friday, October 4, 2019: 12:15 PM

Background. Urinary tract infections (UTIs) are a frequent cause of morbidity and mortality in hospitalized patients, if not adequately and promptly treated. The optimal treatment duration is controversial and most recommendations are based on clinical experience. Current guidelines recommend 5–14 days of treatment depending on the type and severity of infection and the antibiotic used. With the emergence of multi-drug resistance, shorter durations are increasingly favored. This systematic review of randomized controlled trials (RCTs) aims at providing updated evidence on the effectiveness of short (<7 days) vs. long (>7 days) antibiotic regimens in hospitalized adult patients.

Methods. MEDLINE, EMBASE, and CENTRAL were searched to identify relevant RCTs. Trial quality was evaluated using Cochrane’s Risk of Bias Tool. The primary outcome was clinical success. Secondary outcomes included microbiological success, withdrawal due to adverse events (AE), relapse, and reinfection rates. A random-effect meta-analysis was performed using R.

Results. 8 RCTs conducted between 1995 and 2018 were identified. Trial quality was considered poor in 5, fair in 1 and good in 2 RCTs. Clinical and microbiological success was reported in all studies. Withdrawal due to AE was reported in 5, relapse and reinfection in 3 studies. Overall, there was no difference in clinical success between short and long courses (OR = 0.92, 95% CI 0.66–1.29; 211 patients). There was a higher, but nonsignificant, number of withdrawals due to AE in the long duration arm (OR = 0.78, 95% CI 0.29–2.11; 1890 patients). Patients receiving short courses had a non-significant higher number of withdrawals due to adverse events (AE), relapse, and reinfection rates (OR = 0.92, 95% CI 0.66–1.29; 2111 patients) (figure). Similarly, microbiological success was comparable in the two arms (OR = 1.0, 95% CI 0.70–1.43; 211 patients). There was a higher, but nonsignificant, number of withdrawals due to AE in the long duration arm (OR = 0.79, 95% CI 0.29–2.11; 1890 patients). Patients receiving short courses had a non-significant higher rate of relapse (OR = 2.65, 95% CI 0.31–22.39; 175 patients). However, there was no difference in reinfection rates (OR = 1.12, 95% CI 0.26–4.90; 175 patients). A subgroup analysis limited to complicated UTIs showed similar results.

Conclusion. Based on the limited available evidence, short antibiotic courses appear to be equally effective as longer courses in the management of inpatient UTIs. Further research is needed to determine appropriate antibiotic treatment durations and assess treatment-related development of drug resistance.
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1461. Antimicrobial Susceptibility Patterns of Common Complicated Urinary Tract Infection Pathogens in US Hospitals, 2013–2018
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Session: 157. Urinary Tract Infections
Friday, October 4, 2019: 12:15 PM

Background. In response to increasing rates of antimicrobial resistance, carbapenems have become first-line treatments for many infections. This, in turn, fosters the potential for resistance (CR). Efforts to mitigate the emergence of CR through carbapenem-sparing strategies must rest on a fundamental understanding of antibiotic resistance patterns among commonly encountered pathogens. Therefore, we examined the microbiology of complicated urinary tract infections (cUTI) in hospitalized patients in the United States.

Methods. We performed a multicenter retrospective cohort study in the Premier database of approximately 180 hospitals, 2013–2018. Using an ICD-9/10-based algorithm we identified all adult patients hospitalized with cUTI and included those with a positive blood or urine culture. Patients with carbapenem-resistant organisms were excluded. We examined the microbiology and susceptibility to common cUTI antimicrobials (third-generation cephalosporin [C3], fluoroquinolones [FQ], trimethoprim-sulfamethoxazole [TMP/SMZ], fosfomycin [FFM], nitrofurantoin [NFT], and triple-resistant [TR]) over time.

Results. Among 28,057 organisms from 23,331 patients, the 3 most common pathogens were Escherichia coli (41.0%), P. aeruginosa (12.1%), and Klebsiella pneumoniae (11.0%). Among these organisms, resistance to C3 was 10.4% among PA, 12.6% KP, and 48.9% EC. EC was most likely to exhibit resistance to all agents of interest, and demonstrated the highest resistance rate to TMP/SMZ (61.5%), and lowest to NFT (10.4%). In contrast, KP had the highest rate of resistance to NFT (27.9%) and lowest to FQ (4.9%). The lowest rate of resistance among PA was to TMP/SMZ (1.9%), and highest to C3 (10.4%). The prevalence of TR in 2013–2014 and 2017–2018, respectively, was 34.2% and 37.4% for EC, 11.8% and 14.2% for KP, and 7.0% and 4.6% for PA.

Conclusion. Among the most common pathogens isolated in hospitalized patients with cUTI, and particularly in EC, high and increasing single resistance and TR rates to common antimicrobials were evident. Current empiric treatment strategies may be insufficient against the growing threat of TR.

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1462. Derivation of a Prediction Model for Risk of Drug-Resistant Urinary Tract Infection
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Session: 157. Urinary Tract Infections
Friday, October 4, 2019: 12:15 PM

Background. Catheter-associated urinary tract infections (CAUTI) have been shown to increase hospital length of stay, healthcare costs, morbidity, and mortality. Studies that evaluate the role of urinary catheter design in preventing CAUTI are lacking. One such design is the double-balloon (DB) urinary catheter that has a second distal balloon; this design is aimed at reducing mucosal injury and inhibiting coiling of the in situ catheter. We carried out a comparative study to (a) determine whether CAUTI rates differ for different types of urinary catheters, and (b) identify risk factors associated with the acquisition of CAUTI in patients with DB vs. non-double-balloon (NDB) urinary catheters.

Methods. We conducted a retrospective cohort study of all patients who acquired CAUTI from January 2017 through December 2018. We collected age, sex, body mass index, medical history including benign prostatic hypertrophy, urinary tract infection (UTI), prostate cancer, stroke, surgery within the last 30 days including the type of surgery, indication for indwelling urinary catheter, location of catheter insertion, duration of catheterization, presence of pyuria, and type of catheter used. Statistical analyses were carried out using IBM SPSS software. Test statistics included independent sample t-test. CAUTI rates were expressed per 1000 catheter-days.

Results. Among sixty-seven patients acquired CAUTI during the study period. NDB catheters included the following types: Foley, temperature sensing catheters, and coupe catheters. Patients with DB and NDB catheters were similar in age, gender, diabetes, history of stroke, history of recent surgery, or history of UTI. CAUTI rates among patients with the DB-catheters was 28 events per 29,018 catheter-days vs. 39 events per 33,579 catheter-days for NDB catheters (P = NS). On stratification, CAUTI rates for Foley, temperature sensing catheters, and coupe catheters were 1.12, 1.27 and 2.70, respectively (P = NS).

Conclusion. There were no statistically significant differences in CAUTI rates at our facility among patients with DB vs. NDB urinary catheters. The decision on the choice of the catheter for use in our facility will likely depend on the comparative costs of the respective catheters.

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1463. The Rates of UTI Outpatient and Inpatient Visits from 2001 to 2015 Among an Insured Population
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Session: 157. Urinary Tract Infections
Friday, October 4, 2019: 12:15 PM

Background. Hospitalizations attributable to urinary tract infections (UTI) have increased in recent years. One possible reason for the increase in admissions is a lack of effective oral agents, due to increasing rates of antimicrobial resistance, necessitating treatment with IV antibiotics. Our objective was to compare the rates of inpatient vs. outpatient treatment for UTIs.

Methods. We used the MarketScan database to identify UTI inpatient and outpatient visits from January 2001 through September 2015. Incidence rates for inpatient and outpatient visits were determined as a function of people at risk for UTIs. A difference-in-difference model with a change point in 2007 was used.

Results. During our study period, we identified 32,521,647 outpatient visits for UTI and 297,470 inpatient UTI visits. Rates for inpatient and outpatient visits were rising at similar rates before 2007. After 2007, the slopes differed, and the incidence of outpatient visits increased statistically (P = 0.023) when compared with inpatient visits.

Conclusion. Incidence of UTI hospitalizations is increasing but not as quickly as UTI outpatient visits. Since 2007, patients are more likely to be treated in the outpatient setting rather than in the inpatient setting.

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1464. The Utility of Double Balloon Urinary Catheter in Reducing Rates of Catheter-Associated Urinary Tract Infections in a Tertiary Care Teaching Hospital
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Friday, October 4, 2019: 12:15 PM

Background. Catheter-associated urinary tract infections (CAUTI) have been shown to increase hospital length of stay, healthcare costs, morbidity, and mortality. Studies that evaluate the role of urinary catheter design in preventing CAUTI are lacking. One such design is the double-balloon (DB) urinary catheter that has a second distal balloon; this design is aimed at reducing mucosal injury and inhibiting coiling of the in situ catheter. We carried out a comparative study to (a) determine whether CAUTI rates differ for different types of urinary catheters, and (b) identify risk factors associated with the acquisition of CAUTI in patients with DB vs. non-double-balloon (NDB) urinary catheters.

Methods. We conducted a retrospective cohort study of all patients who acquired CAUTI from January 2017 through December 2018. We collected age, sex, body mass index, medical history including benign prostatic hypertrophy, urinary tract infection (UTI), prostate cancer, stroke, surgery within the last 30 days including the type of surgery, indication for indwelling urinary catheter, location of catheter insertion, duration of catheterization, presence of pyuria, and type of catheter used. Statistical analyses were carried out using IBM SPSS software. Test statistics included independent sample t-test. CAUTI rates were expressed per 1000 catheter-days.

Results. Among sixty-seven patients acquired CAUTI during the study period. NDB catheters included the following types: Foley, temperature sensing catheters, and coupe catheters. Patients with DB and NDB catheters were similar in age, gender, diabetes, history of stroke, history of recent surgery, or history of UTI. CAUTI rates among patients with the DB-catheters was 28 events per 29,018 catheter-days vs. 39 events per 33,579 catheter-days for NDB catheters (P = NS). On stratification, CAUTI rates for Foley, temperature sensing catheters, and coupe catheters were 1.12, 1.27 and 2.70, respectively (P = NS).

Conclusion. There were no statistically significant differences in CAUTI rates at our facility among patients with DB vs. NDB urinary catheters. The decision on the choice of the catheter for use in our facility will likely depend on the comparative costs of the respective catheters.

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1465. Resistance to Oral Antibiotics Among Urinary Tract Infection Isolates of Escherichia coli from the United States and Europe in 2017
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Friday, October 4, 2019: 12:15 PM

Background. Clinical guidelines have recommended oral antibiotics such as the cephalosporins, fluoroquinolones, and trimethoprim-sulfamethoxazole (TMP-SMX) for the treatment of urinary tract infections (UTIs) caused by Escherichia coli (EC). The utility of these agents continues to be eroded by increased prevalence of expanded spectrum β-lactamase (ESBL) genes and concomitant resistance determinants to other antimicrobial classes. This study assessed the prevalence of ESBL phenotypes among

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