1426. Empiric Antimicrobial Prescribing for Urinary Tract Infections in Patients Discharged from the Emergency Department
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EMPHERM-NET
Session: P-81. UTIs
Background. Urinary tract infections (UTIs) are commonly treated infections in the emergency department (ED), accounting for 3 million visits annually and 15% of outpatient antibiotic prescriptions. The purpose of this study was to characterize empiric and definitive antimicrobial therapy for treatment of UTIs in a nationally representative sample of ED patients.
Methods. This was a multicenter, retrospective cohort study utilizing the Emergency Medicine PHARMacy Research Network (EMPHERM-NET), a network of 15 geographically diverse EDs. Patients ≥18 years presenting to and discharged home from the ED with primary diagnosis code of cystitis, pyelonephritis, or UTI from 2018-2020 were included. We describe empiric intravenous (IV) and oral antibiotics used for the treatment of UTI in patients seen and discharged from the ED.
Results. Of the 3779 ED patients treated for UTI, most were discharged from the ED (n=2483, 66%). Most patients were female (76.3%) and common comorbidities were hypertension (47.8%) and diabetes (26.5%). Most patients had uncomplicated (39.4%) or complicated (40.9%) cystitis. 1134 (45.6%) had a positive urine culture, mostly E. coli (52.9%) and K. pneumoniae (13%). The most common antibiotics administered in the ED were ceftriaxone (19.7%), nitrofurantoin (6.2%), cephalexin (5.8%), and sulfamethoxazole/trimethoprim (SMX/TMP, 4.8%). The most common antibiotics prescribed at discharge were cefalexin (33.9%), nitrofurantoin (20.6%), SMX/TMP (12%), ciprofloxacin (8.2%), and cotrimoxazole (8%). The mean length of treatment was 7.1 days (standard deviation 2.5 days). Overall, 454 patients returned to the ED within 30 days. The odds of returning to the ED within 30 days was higher in those that did not have appropriate empiric antibiotics based on susceptibilities (OR 1.37, 95% confidence interval 1.06, 1.78).
Conclusion. This multicenter, retrospective cohort study describes ED patients discharged from the ED after UTI diagnosis. Patients presented most commonly for cystitis. Nearly half of discharged patients were culture positive. Antibiotic selection varied; IV ceftriaxone and oral cephalexin were most commonly empirically utilized to treated patients with UTI. Inappropriate antimicrobial selection increased odds of a return ED visit within 30 days.
Disclosures. Megan A. Rech, PharmD, MS, BCCCP, FCCM, Spero (Research Grant or Support) Brett Faine, PharmD, Spero Therapeutics (Research Grant or Support) David A. Talan, MD, AbbVie (Consultant)/GSK (Consultant)/SPERO Therapeutics (Grant/Research Support)

1427. Healthcare Resource Utilization During Hospitalizations with UTI in the US, 2018
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Session: P-81. UTIs
Background. Urinary tract infection (UTI) as the reason for hospitalization costs the US healthcare system nearly $3 billion annually, and is on the rise. We set out to explore the full burden of UTI hospitalizations in the US, including admissions both for UTI and with UTI.
Methods. We conducted a cross-sectional multicenter study within the National Inpatient Sample (NIS) database, a 20% stratified sample of discharges from US hospitals, from 2018, to explore hospital resource utilization of patients discharged with a UTI diagnosis. We divided UTI into mutually exclusive categories of complicated UTI (cUTI), uncomplicated (uUTI), and catheter-associated (CAUTI), in addition to healthcare-associated (HAUTI). We calculated unadjusted hospital charges, costs, average reimbursements, and length of stay (LOS) associated with these infections.
Results. Of 2,837,385 discharges with a UTI code, 77.9% were UTI, 17.6% cUTI (80.2% HAUTI), and 4.4% CAUTI; UTI was principal diagnosis in only 17.0%. Median [interquartile range, IQR] LOS ranged from 4-13 days in uUTI and cUTI to 5-38 days in CAUTI. Overall median [IQR] hospital charges and costs were lowest in uUTI ($36,335 [19,920-$76,745]) and $8,898 [$5,408-$16,092], respectively) and highest in cUTI ($39,690 [21,997-$75,739] and $9,713 [$5,923-$17,423], respectively), with the HAUTI subgroup being most costly ($44,650 [$24,642-$85,628] and $10,945 [$6,573-$19,634], respectively). Septicemia or Severe Sepsis without MV >96 Hours with MCC was the most common DRG in uUTI (13.2%) and cUTI (14.2%), with the corresponding median [IQR] reimbursements of $11,057 [$5,028-$17,757] and $12,226 [$7,889-$19,216], respectively. In contrast, CAUTI was most commonly (44.7%) reimbursed under "Kidney and Urinary Tract Infections without MCC" at $8,635 [$5,693-$13,718].
Conclusion. The nearly 3 million hospital admissions with a UTI represent 8% of all annual admissions in the US. Though the majority are considered uncomplicated, all categories are nearly equally costly. Given that over 80% of UTI-associated admissions are with UTI as a secondary diagnosis, annual estimates of primary UTI costs likely significantly underrepresent the true economic burden of UTI on the US healthcare system.
Disclosures. Marya Zilberberg, MD, MPH, Cleveland Clinic (Consultant)/BK (Shareholder)/Lungpacer (Consultant, Grant/Research Support)/Merck (Grant/Research Support)/nPharma (Consultant)/Sedana (Consultant, Grant/Research Support)/Spero (Grant/Research Support)/Brian Nathanson, PhD, Lungpacer (Grant/Research Support)/Merck (Grant/Research Support)/Spero (Grant/Research Support) Kate Sulham, MPH, Spero Therapeutics (Consultant)

1428. Increased Consumption of Pivmecillinam in Primary Care for Complicated Urinary Tract Infection (uUTI) is Not Associated With Increased Resistance Rates
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Session: P-81. UTIs
Background. The evolution of antibiotic resistance in Escherichia coli (E. coli) hampers the treatment of UTIs, mirroring the global public health concerns around antimicrobial resistance. Pivmecillinam, an oral produg of mecinillan (a β-lactam antibiotic), is used as first-line treatment for uUTIs in Denmark. Here, we examine the use of, and the prevalence of resistance to, mecinillan in Denmark in the primary care setting.
Methods. Nationwide data on the use of and resistance to pivmecillinam (reported as its active form, mecinillan) was extracted and examined from the Danish Integrated Antimicrobial Resistance Monitoring and Research Programme (DANMAP) 2019 report (www.danmap.org). Prevalence estimates of resistance reported by DANMAP 2019 were obtained from the Danish Microbiology Database (MiBA).
Results. In 2019, pivmecillinam accounted for about 27% of penicillins and 75% of penicillins with extended spectrum consumed in primary healthcare in Denmark. Pivmecillinum usage has increased primarily due to changes in recommendations for the treatment of uUTIs. Between 2010 and 2019, pivmecillinum usage in Denmark increased by 45% from 1.67 to 2.43, defined as daily doses per 1,000 inhabitants per day. In 2019, analysis of 83,850 urinary isolates from patients in the primary care setting with E. coli revealed a 5.3% resistance rate to mecinillan. Time-trend analysis using data from a 10-year period showed a small but significant decrease from the 5.5% resistance rate recorded in 2010 (p=0.001). In general, in comparison to using in Denmark, the development of resistance to pivmecillinum has remained low. In fact, a slight decline in pivmecillinum resistance was observed over the past decade.
Conclusion. Despite the rising number of UTIs and the increasing use of pivmecillinum for uUTI in Denmark, over the past decade, the development of resistance to pivmecillinum remains low.
Disclosures. Anne Santerre Henriksen, MS, Advanz (Consultant)/Shionogi BV (Consultant)/UTILITY Therapeutics (Consultant)

1429. Real-World Study of Patients with Uncomplicated Urinary Tract Infection in the United States: High-Risk Comorbidity Conditions and Burden of Illness
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Session: P-81. UTIs
Background. Urinary tract infections (UTIs) are associated with significant morbidity and economic burden, particularly in the elderly and patients with comorbidities. We used real-world data (RWD) to assess healthcare resource use (HRU) and costs in patients with uncomplicated UTI (uUTI) and high-risk comorbid conditions in the US.
Methods. This was a retrospective cohort study (IBM MarketScan RWD, commercial/Medicare Supplemental claims January 1, 2014–December 31, 2017) of females ≥12 years of age with uUTI who had an oral antibiotic prescription ≥ 5 days of UTI diagnosis (index date) and continuous health-plan enrollment for ≥ 1 year pre-/post index date. Five high-risk cohorts and matched-control cohorts (baseline age, region) were identified: controlled type 2 diabetes (T2D), mild/moderately controlled diabetes (MDCD), CKD, recurrent UTI (uUTI), elderly (ELD), and postmenopausal (PMP) (Table 1). Sample sizes were balanced via random match selection (1:5 case:control). uUTI-related HRU and costs were compared between cases and controls (index episode/year follow-up) using multivariable generalized linear models.

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Table 1. Cohort assignment for high-risk cohorts and controls

| High-risk condition | Case definition | Control definition |
|---------------------|----------------|------------------|
| T2D                 | Patients with uUTI and a diagnosis of controlled T2D (uncomplicated) in the baseline period | Patients with uUTI and without diagnosis of T2D (controlled or uncomplicated) at any time during the study period |
| CKD                 | Patients with uUTI and a diagnosis of moderate/advanced CKD in the baseline period | Patients with uUTI and without diagnosis of CKD, ESRD, or dialysis at any time during the study period |
| UUTI                | Patients with ≥ 2 uUTI diagnoses (3 total including index uUTI diagnosis) during 12 months prior to index date, or ≥ 2 total including index episodes) in 12 months prior to index date | Patients with uUTI and with no UTI episodes prior to the index date |
| ELD                 | Patients with uUTI ≥ 65 years of age on index date | Patients with uUTI 12 to < 65 years of age on index date |
| PMP                 | Patients with uUTI ≥ 50 years of age on index date | Patients with uUTI 12 to < 65 years of age on index date |

High-risk cohorts were not mutually exclusive (patients could be included in >1 cohort).

CKD, chronic kidney disease; ELD, elderly; PMP, postmenopausal; uUTI, recurrent urinary tract infection; T2D, type 2 diabetes; uUTI, uncomplicated urinary tract infection.

Results. Of 339,100 patients with uUTI, case/control comprised T2D, n=15,423/n=77,115; CKD, n=1041/n=5205; rUTI, n=7937/n=39,685; ELD, n=23,666/n=118,330; and PMP, n=105,608/n=211,216 patients. HRU trends across cohorts varied. During 1-year followup, outpatient visits were significantly different for cases versus controls in the T2D, rUTI, and PMP cohorts (p ≤ 0.0007), with higher case than control values in the rUTI and PMP cohorts; pharmacy claims were significantly higher for rUTI, ELD, and PMP cases, and inpatient visits were significantly higher for ELD/PMP patients (all p < 0.0001; Table 2). Adjusted total uUTI-related costs (emergency room + outpatient + pharmacy) were significantly different versus controls in the T2D, rUTI, and PMP cohorts; pharmacy claims were significantly higher than control values in the rUTI and PMP cohorts; versus controls (all p ≤ 0.0079), with higher case values than controls at index episode and during follow-up in the T2D cohort, and during follow-up in the rUTI and ELD cohorts (Table 3).

Conclusion. Females in some high-risk case cohorts had higher uUTI-related HRU and costs versus controls. Further studies of relationships between comorbidities and uUTI burden are needed.

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Session: P-81. UTIs

Background. Urinary tract infections (UTI) represent a substantial burden to the healthcare system. In the early 2000s, annual UTI admissions numbered 100,000, and these infections resulted in over 1 million emergency department (ED) visits. While only a fraction of total UTI volume, the estimated cost of complicated (cUTI) to the healthcare system exceeded $3.5 billion. We set out to evaluate the contemporary burden of cUTI visits in the US in terms of ED visits annually.

Methods. We conducted a retrospective multicenter cohort study within the National Emergency Department (NEDS) database, a 20-percent stratified sample of all US hospital-based EDs, from 2012-2018, to explore characteristics of patients discharged with a cUTI diagnosis. We applied a previously published algorithm to identify cUTI using administrative coding. We applied survey methods to develop national estimates.

Results. Among 3,010,997 ED visits with cUTI, 43.3% were female, and 59.0% were age 65 years or older. Commensurate, Medicare was the primary payor in 62.8% of the visits. The majority of the patients (59.1%) presented to metropolitan teaching hospitals, and plurality were in the Southern US (39.6%). There was a narrow range in the visits’ seasonal variation, from 6.4% occurring in February to 7.9% in October. cUTI was the principal diagnosis in 48.5% of all cUTI visits. In the remaining 51.5%, sepsis was the most common principal diagnosis (33.9%), but severe sepsis and septic shock codes each appeared in 4.9%. Of all cUTI ED visits, 21.4% had catheter-associated UTI. While only 19.8% had a code for pyelonephritis, 2,050,548 (68.1%) were from patients hospitalized with ED visits.

Conclusion. During the seven-year span, there were over 3 million ED visits for cUTI. Although fewer than 1 in 10 patients met criteria for severe sepsis/septic shock, approximately 2/3rds of cUTI patients presenting to the ED were subsequently hospitalized.

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1431. Evaluating Physician Decision Making in Inpatient Antibiotic Prescription for Suspected Urinary Tract Infection Among Veterans with Neurogenic Bladder

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