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1416. Medicare Spending on Urinary Tract Infections: A Retrospective Database Analysis

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Session: P-81. UTIs

Background. Medical visits for UTIs represent 1%-6% of all healthcare visits (~7 million visits) and are estimated to cost the United States (US) healthcare system at least $1.6 billion annually. UTIs are associated with significant morbidity; particularly among the elderly, where UTIs are most prevalent. Little is known about the specific costs to Medicare of UTI; here, we seek to examine overall Medicare spending on UTI.

Methods. We conducted a retrospective multicenter cohort study of the Medicare fee-for-service (FFS) data. Patients were included for analysis if the following criteria were met: (1) enrolled in Medicare FFS from January 1, 2016 through December 31, 2019, (2) not enrolled in Medicare Advantage during that time period, (3) did not have any UTI diagnoses in 2016, and (4) enrolled in Medicare Part D. Individuals were categorized as having uncomplicated UTI (uUTI), complicated UTI (cUTI), or those who first had a uUTI that progressed to a cUTI (uUTI to cUTI). Medicare spending in the 12 months post-diagnosis was calculated, and patients were stratified by home- or institutionally-based (eg, nursing home, long-term care facility, etc.).

Results. 2,330,123 patients were included for analysis; 92% were home-based, 8% were institutionally-based. Mean Charlson Comorbidity Index (CCI) across all patients was 2.16. In the 12 months after initial diagnosis, average Medicare spend was $33,984, $9,941 of which was UTI-related. Annual UTI-related costs were approximated $9,000 for home-based vs. $21,444 for institutionally-based patients. Mean drug spend per patient on antibiotics was $872. Broadly, uUTI patients were least expensive, followed by cUTI patients, with uUTI to cUTI patients being most expensive. Higher costs for were observed for institutionally-based patients, largely due to more frequent acute hospitalizations and more Part A-paid skilled nursing stays.

Conclusion. UTI-related spending represents approximately one-third of total annual Medicare spend for patients diagnosed with a UTI. Given average Medicare spending of approximately $12,000 per person in 2019, UTI is associated with substantially increased per patient cost and represents a significant source of spending for Medicare.

Disclosures. **Kate Sulham, MPH**, **Spero Therapeutics** (Consultant) **Eric Hammelman, MBA**, **AbbVie Pharmaceuticals** (Consultant)**Edwards Lifesciences** (Consultant)**Genentech** (Consultant)**Spero Therapeutics** (Consultant)**Vertex Pharmaceuticals** (Consultant)

1417. Fosfomycin Use in the Treatment of Complicated Urinary Tract Infections at a Veterans Affairs Medical Center

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Session: P-81. UTIs

Background. The prevalence of multidrug resistant gram-negative urinary tract infections (UTIs) is increasing, often requiring intravenous antimicrobial therapy. Oral fosfomycin is a recommended alternative agent for the treatment of cystitis caused by extended spectrum beta-lactamase (ESBL)-producing *Escherichia coli* (E. coli). The primary objective of this study is to evaluate the efficacy of fosfomycin in the treatment of UTIs at the Veterans Affairs Long Beach Healthcare System. The secondary objective is to assess the incidence of adverse drug reactions associated with fosfomycin.

Methods. This is a retrospective, single-center, cohort study. Patients who received fosfomycin between June 1st, 2015 – June 30th, 2020 were included. Data collection was completed by chart review through the Computerized Patient Record System (CPRS). Descriptive analysis was used to evaluate data. Treatment outcomes were analyzed using a composite of clinical and microbiological cure. Clinical cure was defined as resolution of UTI symptoms. Microbiological cure was defined as urine sterilization within 1 month after completing treatment course with fosfomycin.

Results. A total of 62 unique patients were evaluated in this study. The mean age was 71.9 years. 56 patients (90.3%) were male, 31 patients (50.0%) had an indwelling catheter present at the time of treatment, and 48 patients (77.4%) had the presence of genitourinary tract pathology that may increase the risk of developing UTIs. Majority of patients (50%) had a urine culture result positive for *E. coli* prior to treatment, of which 43.5% were ESBL-producing. 60 patients (96.8%) received more than 1 dose of Fosfomycin. Out of 29 patients who were eligible to be evaluated for clinical outcomes, 20 patients (68.9%) met a positive composite outcome of either microbiological cure, clinical cure, or both. 4 patients (6.5%) experienced an adverse drug reaction of diarrhea that was self-limited.

Conclusion. Fosfomycin is an effective and well-tolerated antimicrobial agent that may be considered for treatment of complicated UTIs without evidence of pyelonephritis or bacteremia caused by multi-drug resistant organisms in the veteran population.

Disclosures. **All Authors**: No reported disclosures

1418. Single Center Treatment Patterns for Asymptomatic Bacteriuria and UTIs in Kidney Transplant Recipients: Are We Still Overtreating?

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Session: P-81. UTIs

Background. In February 2019, the American Society of Transplantation (AST) published guidelines on the management of asymptomatic bacteriuria (AB) and urinary tract infections (UTIs) in kidney transplant (KT) recipients. These recommendations include avoiding treatment of AB > 2 months post-transplant and outline the duration of treatment (DT) for uncomplicated and complicated UTIs. We reviewed management of these syndromes and guideline concordance at our institution.

Methods. We conducted a single-center, retrospective cohort study of KT recipients age > 18 years who underwent transplantation between June 2016 - June 2020. Patients were obtained through query of our electronic medical record for documented UTI syndromes and included if a diagnosis was confirmed between March 2019 - December 2020 upon chart review. Definitions of AB, complicated UTI, and uncomplicated UTI were based on AST definitions. Patients with AB < 2 months post-transplant were excluded. Outcomes included treatment of AB, DT, 30-day hospital admission and re-admission, and 30-day mortality. Bivariate analysis was conducted using chi square and t test.

Results. Seventy-four patients (mean age 55.4 years, 62.0% female) were included. Twenty-one patients had AB, 90% of whom received antibiotics. Distribution of diagnoses and median DT among those treated with antibiotics is outlined in Table 1.

Overall DT was similar in patients whose care included infectious disease (ID) input and those who did not (10.0 vs. 10.0 days, p=0.12), although ID involvement was more common in complicated UTIs. There was no difference in 30-day admission rates for those receiving < 7 days vs. > 7 days of antibiotics (p=0.53) (Table 2) including those with complicated UTIs (5/15 in < 7 days (33%) vs. 4/18 in > 7 days (22%) p=0.49). There were no deaths within 30 days of diagnoses.

Table 1 UTI Subgroup Distribution and Duration of Antibiotics for Treated Patients

Diagnosis	Total	AB	Uncomplicated UTI	Complicated UTI	Complicated UTI - Other[a]	No UTI[b]
n (%)	72	19 (26)	6 (8)	33 (46)	9 (13)	5 (7)
Antibiotic Duration median days (Interquartile range)	10 (7-14)	10 (7-12)	14 (10-14)	7 (7-14)	27 (10-42)	7 (7-10)
Treatment Setting						
Outpatient n (%)	30	15 (50)	5 (17)	6 (20)	0 (0)	4 (13)
Inpatient n (%)	42	4 (10)	1 (3)	27 (64)	9 (21)	1 (2)
ID Consultation						
No ID Consult n (%)	34	16 (47)	6 (18)	7 (20)	0 (0)	5 (15)
ID Consult n (%)	38	3 (8)	0 (0)	26 (68)	9 (24)	0 (0)

[a]Includes renal abscess, hematoma, epididymidoorchitis, or concurrent non-UTI infection present (i.e. surgical site infection)
[b]Patients who were given antimicrobials but did not have evidence of AB or UTI according to guideline criteria or an alternative explanation for antibiotic use

Table 2 30-day Hospital Admissions

	Total n	Not admitted within 30 days n (%)	Admitted within 30 days n (%)	p value
n (%)	72	58 (81)	14 (19)	
Antibiotic Duration				
≤ 7 days	31	26 (84)	5 (16)	0.53
> 7 days	41	32 (78)	9 (22)	
Uropathogen Sensitivity				
Non-MDRO[c]	62	50 (81)	12 (19)	0.96
MDRO	10	8 (80)	2 (20)	

[c]Multi-drug resistant organism

Conclusion. Despite guidelines, treatment of AB is common and uncomplicated UTIs often receive prolonged courses of antibiotics. There was no increased risk of admission or mortality with shorter DT, though these results should be interpreted cautiously given the small sample size. Greater stewardship efforts are needed in this high-risk population.

Disclosures. **Kelsie Cowman, MPH**, **Merck** (Research Grant or Support)

1419. High Prevalence of Fluoroquinolone-Resistant Urinary Tract Infection Among US Emergency Department Patients Diagnosed with UTI, 2018-2020

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Emergency Medicine PHARMacy Research NETwork (EMPHARM-NET)

Session: P-81. UTIs

Background. Uropathogen resistance, Fluoroquinolone-resistance (FQR) and Extended spectrum beta-lactamase (ESBL), has been observed to be emerging worldwide with prevalences above recommended thresholds for routine empirical treatment. We sought to determine recent resistance prevalence from a geographically diverse sample of US Emergency Departments (ED).

Methods. We conducted a multi-center, observational cohort study utilizing a network of 15 geographically diverse US EDs. Patients ≥ 18 years of age with the primary international classification of diseases (ICD-10) diagnosis code of cystitis, pyelonephritis, or urinary tract infection (UTI) and were discharged home from the ED from 2018-2020 were included. We calculated descriptive statistics for uropathogens and susceptibilities. Logistic regression analysis was used to identify antimicrobial resistance risk factors associated with fluoroquinolone (FQ)-resistant *Escherichia coli*.

Results. Among 3,779 patients who met inclusion criteria, median age was 62.9 years (IQR: 41-77.6) and 76.3% were female. The most common diagnoses were complicated (40.9%) and uncomplicated cystitis (39.4%). Six hundred and forty-five (17%) patients reported receiving antimicrobials in the previous 90-days. *E. coli* was the most common pathogen (62.9%), followed by *Klebsiella pneumoniae* (13%) and *Enterococcus* species (5.8%). Across all sites, overall *E. coli* FQ-resistance prevalence was 22.1%, ranging from 10.5 to 29.7% by site. The prevalence of ESBL-producing uropathogen was 4.4%, ranging from 2.3% to 8.6% by site. Previous IV or oral antimicrobial use in the last 90-days and complicated vs. uncomplicated UTI were associated with FQ-resistant *E. coli* (OR 1.69, 95% CI: 1.33-2.14, and OR 1.60, 95% CI: 1.26-2.02, respectively). Of the most prescribed oral antibiotics upon patients discharged from the ED, *E. coli* resistance to nitrofurantoin and cephalexin was 1.8% and 0.9%, respectively.

Conclusion. FQ-resistant *E. coli* is widely prevalent and ESBL-mediated resistance appears to be emerging across US sites highlighting the need for ongoing monitoring of antimicrobial resistance and, at some locations, modification of empirical treatments.

Disclosures. **Brett Faine, PharmD**, **Spero Therapeutics** (Research Grant or Support) **Megan A. Rech, PharmD, MS, BCCCP, FCCM**, **Spero** (Research Grant or Support) **David A. Talan, MD**, **AbbVie** (Consultant)**GSK** (Consultant)**SPERO Therapeutics** (Grant/Research Support)

1420. Descriptive Epidemiology of UTI Hospitalizations in the US, 2018

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Session: P-81. UTIs

Background. In parallel with an increase in antimicrobial resistance, urinary tract infections (UTI), one of the most common diagnoses among hospitalized patients in the US, have been on the rise. Though mostly emphasized as a hospital-acquired complication among patients with an indwelling catheter, quantification of the full contemporary burden of UTI-associated hospitalizations is limited.

Methods. We conducted a cross-sectional multicenter study within the National Inpatient Sample (NIS) database, a 20-percent stratified sample of discharges from US community hospitals, from 2018, to explore characteristics of patients discharged with a UTI diagnosis. We divided UTI into mutually exclusive categories of complicated (cUTI), uncomplicated (uUTI), and catheter-associated (CAUTI). We applied survey methods to develop national estimates.

Results. Among 2,837,385 discharges with a UTI code, 77.9% were uUTI, 17.6% cUTI, and 4.4% CAUTI. Compared to patients with uUTI (mean age 69.0 years), those with CAUTI and cUTI were older (70.1 and 69.7 years), but had same comorbidity burden (mean Charlson 4.3) as cUTI (4.3) and lower than CAUTI (4.6). Compared to other geographic regions, the Northeast had the lowest proportion of uUTI (74.6%) and highest of cUTI (20.8%) while the South had highest uUTI (80.2%) and lowest cUTI (15.7%). Over 60% of all UTI, regardless of type, were in large, and nearly ½ in urban teaching, institutions, and >80% came through the emergency department. Antimicrobial resistance codes were infrequent, but extended spectrum beta-lactamase organisms were more common in CAUTI (2.7%) and cUTI (2.1%) than in uUTI (1.6%). Among the 83.0% of discharges whose UTI was a secondary diagnosis, sepsis was the most common principal diagnosis, ranging from 17.7% in uUTI to 22.3% in cUTI. Although relatively low across the board, hospital mortality was lowest in cUTI (2.8%) and highest in uUTI (3.9%). Discharges to a chronic care facility were most common in CAUTI (46.7%) and least common in cUTI (33.3%).

Conclusion. There are nearly 3 million hospital admissions with a UTI, comprising fully 8% of all annual admissions in the US. Though most are considered uncomplicated, there are few differences in characteristics or outcomes across the categories.

Disclosures. **Marya Zilberberg, MD, MPH**, **Cleveland Clinic** (Consultant)**J&J** (Shareholder)**Lungpacer** (Consultant, Grant/Research Support)**Merck** (Grant/Research Support)**scPharma** (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)

1421. Empiric Fluoroquinolone Prescribing Trends for Cystitis in Primary Care

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Session: P-81. UTIs

Background. Understanding outpatient antibiotic prescribing practices for urinary tract infections (UTIs) is vital in guiding future stewardship initiatives. Focusing on fluoroquinolones (FQs) is of value as FQs are commonly prescribed, but not recommended as first line therapy by the Infectious Diseases Society of America (IDSA) cystitis treatment guidelines and are also associated with multiple adverse effects. Boxed warnings state FQs should be reserved for patients with no alternative treatment options, due to risk of aortic dissection, *C. difficile* infection, antimicrobial resistance as well as tendon, joint, muscle, and nervous system damage.

Methods. This descriptive study assessed rates of guideline concordant empiric FQ prescribing from March 1 to June 30, 2019. Adult women prescribed an oral FQ for acute uncomplicated cystitis at a primary care clinic were included. Men, pregnant or breastfeeding women, and patients with pyelonephritis, urologic abnormality, or antibiotic use in the past 30 days were excluded. The primary outcome was the incidence of IDSA guideline concordance among FQs empirically prescribed. Guideline concordant empiric FQ therapy was defined as correct drug, dose, duration and frequency per IDSA guidelines when no first line drug is indicated due to allergy, adverse effect, previous treatment failure or most recent previous urine culture showing bacterial resistance. Secondary outcomes were mean dose (mg), mean duration (days) and incidence of adverse effects.

Results. Of 95 FQ prescriptions included, none met the primary outcome definition. Rates of guideline concordance for each component of the primary outcome definition were 6% for drug selection, 38% for dose, 37% for duration, and 99% for frequency. Mean daily doses exceeded guideline recommended doses by 62% and 100% for ciprofloxacin and levofloxacin, respectively. Mean duration was 5 days, 66% longer than 3 days as recommended by IDSA guidelines. Of 66 patients with documented follow up within 30 days, 3 (5%) experienced an adverse effect, and none developed *C. difficile* infection.

Conclusion. Current outpatient FQ prescribing for acute uncomplicated cystitis does not align with IDSA guidelines. Multifaceted antimicrobial stewardship initiatives are required to improve appropriate FQ use.

Disclosures. **All Authors**: No reported disclosures

1422. Real-World Study of the Effects of Inappropriate or Suboptimal Treatment on the Burden of Illness Among Patients with Uncomplicated Urinary Tract Infection and High-Risk Comorbid Conditions in the United States

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Session: P-81. UTIs

Background. Urinary tract infections (UTIs) are associated with significant morbidity and economic burden. Nitrofurantoin (NFT) and fosfomycin are among the first-line treatments for uncomplicated UTI (uUTI) recommended by Infectious Diseases Society of America (IDSA) 2011 guidance. We used real-world data (RWD) to assess patterns of appropriate and optimal (AP&OP) and inappropriate or suboptimal (IA/SO) antibiotic (AB) prescribing (RX), and related healthcare resource use (HRU) and costs, in US uUTI patients with high-risk comorbid conditions.

Methods. This was a retrospective cohort study of RWD (IBM MarketScan, commercial/Medicare Supplemental claims January 1, 2014–December 31, 2017) in females ≥ 12 years of age with uUTI, who had an oral AB prescription ± 5 days of uUTI diagnosis (index date) and continuous health-plan enrollment ≥ 1 year pre-/post-index date. Patients were stratified into high-risk cohorts (**Table 1**) and by AB RX (AP&OP and IA/SO) during first uUTI episode (within 28 days of index). AP&OP RX followed IDSA guidance, IA RX did not; SO RX was considered a proxy for treatment failure (e.g., AB switch or a second UTI diagnosis [acute care setting] in index episode). Sample size was balanced via random match selection, AP&OP:IA/SO ratio 1:5 (age and region). uUTIrelated HRU and costs were compared between cohorts (at index episode and 1-year follow-up) via multivariable analysis.

Table 1. High-risk cohorts identified in the study

High-risk condition	Case definition
T2D	Patients with uUTI and a diagnosis of controlled T2D in the baseline period
CKD*	Patients with uUTI and a diagnosis of mild/moderate CKD in the baseline period
rUTI	Patients with rUTI in the baseline period (≥ 2 UTI episodes in 12 months or 1 episode in 6 months prior to index date)
ELD	Patients with uUTI ≥ 65 years of age at index date
PMP†	Patients with uUTI ≥ 50 years of age at index date

High-risk cohorts were not mutually exclusive.

*The CKD cohort (n=1044) had an insufficient sample size and so was not considered for further analysis; †By definition, the PMP cohort included all patients identified as ELD.

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

Results. IA/SO AB RX was highest in the elderly cohort (94.3%, likely influenced by renal impairment/no NFT RX in this group) and > 90% in other cohorts; AP&OP AB RX was highest in the postmenopausal cohort (9.0%). IA/SO AB RX in all cohorts was associated with significantly higher uUTI-related HRU (outpatient visits and pharmacy