calendar year, from January 1, 2010 till December 31, 2017. Sensitivity to antibiotics was determined using disk-diffusion methods and interpreted according to CLSI guidelines.

Results. A total of 26774 urinary samples were processed in the mentioned period and were analyzed for this study. Of these, 84% were from women, mean (SD) age was 59.7(20.4) years. Distribution according to bacterial genus and species was: *E. coli*: 84.6%; *Klebsiella pneumoniae*: 9.9%; *Proteus sp.*: 5.5% There were no significant differences in gender, mean age or bacterial genus/species distribution according to calendar year. When comparing 2010 to 2017 we found significant differences in the prevalence of resistance to fluoroquinolones: 26.6% vs. 33.6% respectively, P < 0.01; third G cephalosporins: 5.2% vs. 10.0%, P < 0.01; carbapenems: 0.2% vs. 0.4%, P < 0.01. Prevalence of resistance to TMS (39.0% vs. 40.2%) and nitrofurans (11.9% vs. 10.3%) remained stable. Results of analysis of resistance according to bacterial genus/species comparing results from 2010 to results from 2017 are shown on the table.

Conclusion. Resistance to antibiotics in *Enterobacteriaceae* recovered from urinary samples has increased significantly in the last years, especially for quinolones, third G cephalosporins (100% increase) and carbapenems (100% increase). Resistance to TMS was high but remained stable. *E coli* shows very good sensitivity to nitrofurantoin. It is key to improve and amplify the measures to prevent emergence of resistance and aim to revert this increasing trend in urinary tract infections from the community.

Table: Proportion (%) of samples with resistance to different antibiotics according to bacterial genus/species for 2010 and 2017. In **bold** the proportions that show statistically significant differences between 2010 and 2017 (p < 0.01)

	AMPI		1st G CEF		3rd G CEF		CARBAP		FQUINO		TMS		NTF	
	2010	2017	2010	2017	2010	2017	2010	2017	2010	2017	2010	2017	2010	2017
E. coli	59,4	63,4	17,3	11,9	3,9	8,6	0,0	0,1	28,1	34,7	40,6	41,8	3,6	3,3
K. pneu	100	100	26,4	29,9	16,8	24,0	1,8	4,1	22,0	28,7	31,5	33,7	33,3	31,1
P. sp	25,1	26,2	10,8	11,2	4,8	7,8	0,0	0,0	19,0	17,9	27,5	23,5	93,8	100
TOTAL	61,2	65,1	17,8	13,5	5,2	10,0	0,2	0,4	26,6	33,6	39,0	40,2	11,9	10,3

Disclosures. All authors: No reported disclosures.

1457. Antimicrobial Resistance of Urinary Tract Infection Pathogens in South Korea: A Surveillance Report of the One-Year Assessment in 2017

Changseung Liu, MD[1]; Eun-Jeong Yoon, PhD[1]; Dokyun Kim, MD, PhD[1]; Jong Hee Shin, MD, PhD[2]; Jeong Hwan Shin, MD, PhD[3]; Kyeong Seob Shin, MD, PhD[4]; Young Ah Kim, MD, PhD[5]; Young Uh, MD, PhD[6]; Hyun Soo Kim, MD, PhD[7]; Young Ree Kim, MD, PhD[8]; Seok Hoon Jeong, MD, PhD[2]; [1]Yonsei University College of Medicine, Seoul, South Korea, Seoul, Seoul-t'ukpyolsi, Republic of Korea; [2]Chonnam National University Medical School, Kwangju, Kwangju-jikhalsi, Republic of Korea; [3]Inje University College of Medicine, Busan, Pusan-jikhalsi, Republic of Korea; [4]Chungbuk National University College of Medicine, Cheongju, Ch'ungch'ongbukto, Republic of Korea; [5]National Health Insurance Service Ilsan Hospital, Goyang, Kyonggi-do, Republic of Korea; [6]Yonsei University Wonju College of Medicine, Wonju, Kangwon-do, Republic of Korea; [7]Hallym University College of Medicine, Hwaseong, Kyonggi-do, Republic of Korea; [8]Jeju National University School of Medicine, Jeju, Cheju-do, Republic of Korea
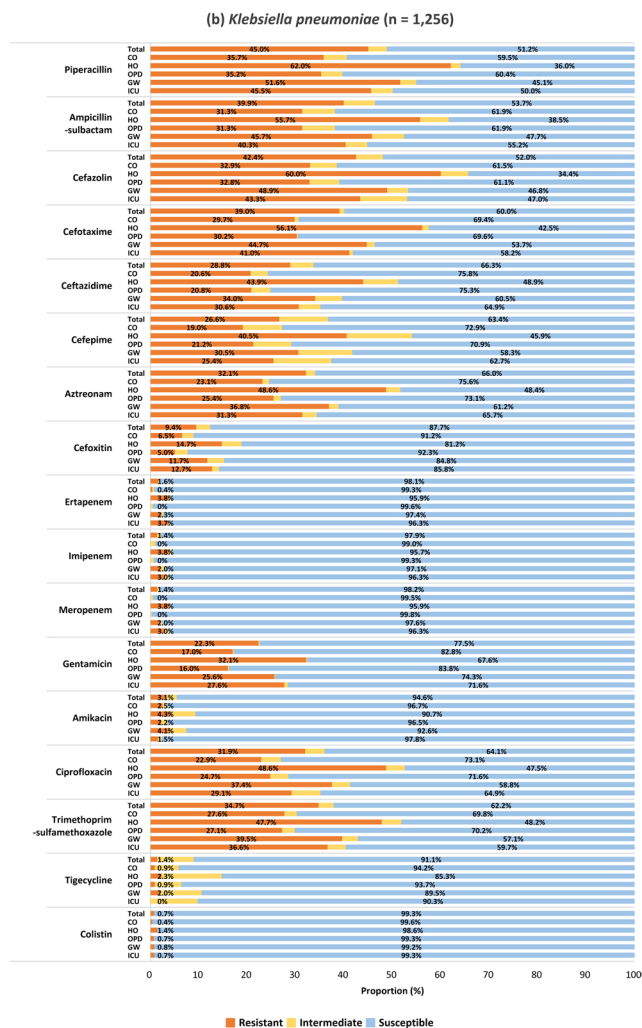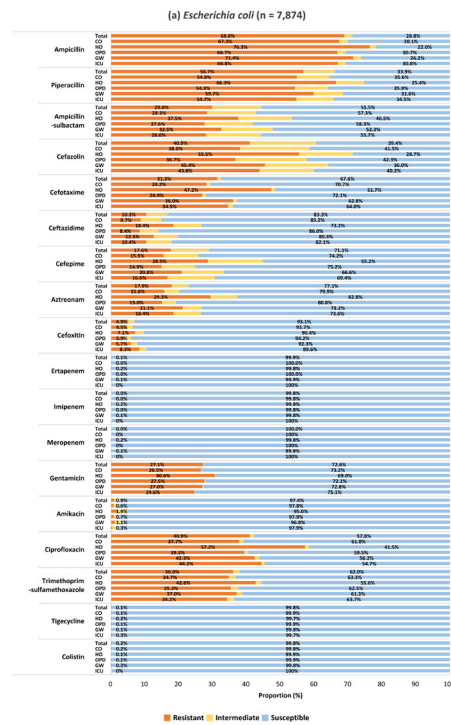
Session: 157. Urinary Tract Infections
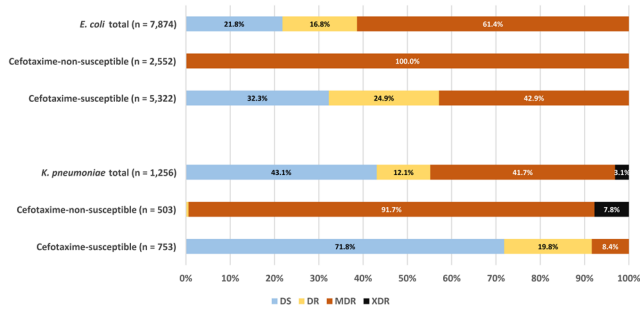*Friday, October 4, 2019: 12:15 PM*

Background. Korean Antimicrobial Surveillance System (Kor-GLASS) was established in 2016, which is compatible with the Global Antimicrobial Resistance Surveillance System launched by WHO. Here, we report a one-year assessment of Kor-GLASS in 2017, focusing on the antimicrobial resistance of urine isolates.

Methods. Non-duplicated clinical isolates of *E. coli* and *K. pneumoniae* recovered from urine cultures were collected from 8 sentinel hospitals. Demographic information, infection origin (hospital origin or community origin), and admission type were investigated. Bacterial species were confirmed using a matrix-assisted laser desorption/ ionization time-of-flight mass spectrometer. Antimicrobial susceptibility was tested by disk diffusion and broth microdilution methods.

Results. During the one-year period of surveillance from January 2017 to December 2017, a total of 9,130 (11.9%) isolates of target pathogens were recovered from urine specimens of 76,625 patients with suspected urinary tract infection (UTI). The rate of culture-positive was the highest in the < 1 age group (AG) (22.5%), stiffly decreased in the 5–<15 AG to 3.4%, and gradually increased with age up to 19.6% in the ≥ 85 AG. The mean occurrence of UTI per 10,000 patient-days for inpatients was 19.3 (range, 3.4–46.1) for *E. coli* and 4.0 (range, 1.5–7.3) for *K. pneumoniae*. Resistance rate for cefotaxime was higher than those for ceftazidime both in *E. coli* (31.3% vs. 10.3%) and *K. pneumoniae* isolates (39.0% vs. 29.8%). Resistance rate for ciprofloxacin in *E. coli* isolates was 40.9%, and that in *K. pneumoniae* isolates was 31.9%. Only 4.9% and 10.9% of *E. coli* and *K. pneumoniae* isolates exhibited resistance phenotype to cefoxitin, respectively. Ertapenem-resistance was more frequently identified in *K. pneumoniae* isolates (1.6%) than in *E. coli* isolates (0.1%). Multidrug-resistance (MDR) phenotype was identified in 61.4% of the *E. coli* and 44.8% of *K. pneumoniae* urine isolates.

Conclusion. Kor-GLASS generated well-curated surveillance data devoid of collection bias or isolate duplication. Cefoxitin was an alternative treatment to ciprofloxacin for urinary tract infections caused by *Enterobacteriaceae*. About one-half of urine isolates belonged to either MDR or XDR.

(a) *Escherichia coli* (n = 7,874)

(b) *Klebsiella pneumoniae* (n = 1,256)

E. coli total (n = 7,874)	21.8%	16.8%	61.4%
Cefotaxime-non-susceptible (n = 2,552)		100.0%	
Cefotaxime-susceptible (n = 5,322)	32.3%	24.9%	42.9%
K. pneumoniae total (n = 1,256)	43.1%	12.1%	41.7% / 3.1%
Cefotaxime-non-susceptible (n = 503)		91.7%	7.8%
Cefotaxime-susceptible (n = 753)	71.8%	19.8%	8.4%

DS DR MDR XDR

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)

Ryan K. Shields, PharmD, MS[1]; Hemanth Kanakamedala, BS[2]; Yun Zhou, MS[2]; Bin Cai, MD, PhD[3]; [1]University of Pittsburgh, Pittsburgh, Pennsylvania; [2]Genesis Research Inc., Hoboken, New Jersey; [3]Shionogi Inc., Florham Park, New Jersey

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 (GNB) bacteria in the USA. We aimed to characterize the burden of UTIs caused by carbapenem-resistant (CR) or -susceptible (CS) GNB 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 GNB 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.

Table.

	With bacteremia N=11,212			Without bacteremia N=34,864		
	CR N=191	CS N=11,021	P value	CR N=1,798	CS N=33,066	P value
Discharge status, N (%)						
Death	20 (10.5)	679 (6.2)	0.015	71 (4.0)	1,371 (4.2)	0.682
Home	59 (30.9)	6,088 (55.2)	<0.001	706 (39.3)	16,401 (49.6)	<0.001
Overall LOS,						
median days	9	7	<0.001	8	6	<0.001
IQR	7 – 17	5 – 10		5 – 12	4 – 10	
Infection-associated LOS (from index culture to discharge)						
median days	9	7	<0.001	7	6	<0.001
IQR	7 – 14	5 – 10		5 – 10	4 – 9	
Total LOS charges $,						
median	76,000	38,502	<0.001	42,648	36,118	<0.001
IQR	36,492 – 138,077	23,295 – 68,845		24,601 – 78,085	20,790 – 69,435	
ICU admission, N (%)	110 (57.6)	4,978 (45.2)	0.001	542 (30.1)	10,301 (31.2)	0.368
Total ICU LOS charges $,						
median	11,904	9,284	0.007	9,410	8,600	0.639
IQR	4,447 – 36,297	4,089 – 19,720		1,877 – 23,814	2,125 – 23,500	

1459. Oral Cephalosporins vs. Fluoroquinolones for the Empiric Treatment of Acute Uncomplicated Pyelonephritis

Kevin Lin, PharmD[1]; Jessica Ortwine, PharmD, BCPS-AQID[2]; Norman Mang, PharmD, BCIDP[2]; Wenjing Wei, PharmD, BCPS-AQID[2]; Bonnie C. Prokesch, MD[3]; [1]Parkland Hospital, Dallas, Texas; [2]Parkland Health and Hospital System, Dallas, Texas; [3]Assistant Professor of Internal Medicine, Dallas, Texas

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 (CPHs) in AUP are limited. The purpose of this study was to provide additional evidence for the safe and effective use of oral CPHs for empiric treatment of AUP.

Methods. Retrospective chart review was performed on all patients prescribed oral CPHs 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 (ADRs), 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 CPHs (21.4% vs. 21.7%). A higher rate of treatment failure was observed for first-generation (1GC) CPHs compared with second-generation (2GC) or third-generation (3GC) CPHs (19/51 [43.1%] vs. 18/107 [16.8%] vs. 9/68 [13.2%]). The primary reason for treatment failure was modification to an alternative antibiotic, and was highest for oral 1GC, followed by FQs, then 2GC and 3GC (19/51 [37.3%] vs. 14/107 [13.1%] vs. 11/107 [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 CPHs (8/226 [3.5%]) vs. FQs (9/107 [8.4%]). Documented ADRs were low (5/333 [1.5%]) and none developed CDI.

Conclusion. Oral CPHs appear to be as 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.

1460. The Effectiveness of Short vs. Long Antibiotic Therapy in Hospitalized Adult Patients with Urinary Tract Infections: A Systematic Review and Meta-Analysis

Tala Ballouz, MD, MPH; Nesrine Rizk, MD; American University of Beirut, Beirut, Beyrouth, Lebanon

Session: 157. Urinary Tract Infections
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; 2111 patients) (figure). Similarly, microbiological success was comparable in the two arms (OR = 1.0, 95% CI 0.70–1.43; 2111 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 nonsignificant 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.

Study	Experimental Events	Total	Control Events	Total	Odds Ratio	OR	95%-CI	Weight
Gier, 1995	11	26	11	28		1.13	[0.38; 3.36]	7.5%
Dow, 2004	19	30	16	30		1.51	[0.54; 4.24]	8.0%
Peterson, 2008	262	537	237	556		1.28	[1.01; 1.63]	21.6%
Sandberg, 2012	71	126	80	122		0.68	[0.41; 1.13]	16.0%
Darouiche , 2014	28	33	27	28		0.21	[0.02; 1.89]	2.4%
Nieuwkoop, 2017	85	94	94	100		0.60	[0.21; 1.76]	7.6%
Dinh, 2017	28	49	36	51		0.56	[0.24; 1.27]	10.6%
Wagenlehner, 2018 (Arm 1)	49	76	49	76		0.96	[0.49; 1.88]	13.1%
Wagenlehner, 2018 (Arm 2)	49	76	44	74		1.24	[0.64; 2.39]	13.2%
Random effects model		**1047**		**1064**		**0.92**	**[0.66; 1.29]**	**100.0%**
Prediction interval							**[0.36; 2.39]**	

Heterogeneity: $I^2 = 31\%$, $\tau^2 = 0.1412$, $p = 0.17$