1470. Linezolid for Treatment of Urinary Tract Infections Caused by Vancomycin-resistant *Enterococci*

Benjamin Pontefract, PharmD, BCPS[1]; Karl Madaras-Kelly, PharmD, MPH[2]; [1]Boise VA Medical Center, Boise, Idaho; [2]Idaho State University, Boise, Idaho

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Friday, October 4, 2019: 12:15 PM

Background. Urinary tract infections (UTI) caused by vancomycin-resistant enterococcus (VRE) are difficult to manage due to lack of effective oral treatment options. Linezolid is an antibiotic with activity against VRE that is available orally, but only 30% of each dose is excreted in the urine. Data on the efficacy of linezolid in the treatment of UTI is limited. The purpose of this analysis was to assess the comparative efficacy of linezolid to other VRE-active antibiotics in the treatment of UTI.

Methods. A national retrospective cohort of inpatient veterans with a positive urine culture for VRE during years 2013 through 2018 was developed. Patient demographics, vital signs, urinary symptoms, antibiotics prescribed, and 14-day post-treatment outcomes were collected. Patients without UTI symptoms, urine cultures with $< 10^5$ CFU/mL ($<10^3$ CFU/mL for catheterized patients), or patients not treated with VRE-active antibiotics were excluded. Odds ratios were used to compare linezolid and non-linezolid antibiotics for 14-day VRE bacteriuria, UTI retreatment, and death endpoints.

Results. Of 3,846 urine cultures identified with VRE, 624 (16%) patients were eligible for evaluation of UTI symptoms. Of these, 92/624 (15%) met study criteria. The primary reason for exclusion was asymptomatic bacteriuria [339/532 (64%)]. Linezolid was prescribed in 54/92 (59%) of cases. Comparators included penicillin's [12/92 (13%)], nitrofurantoin [11/92 (12%)], daptomycin [7/92 (8%)], tetracycline's [6/92 (7%)], and others [2/92 (2%)]. Between linezolid and comparator groups, mean (+S.D.) patient age [70 (12) vs. 68 (13) years, $P = 0.45$] and Charlson Comorbidity Index [8.9 (3.1) vs. 8.3 (3.5), $P = 0.39$] were similar. Negative outcomes were uncommon: 7% VRE bacteriuria, 8% UTI re-treatment, 4% death. No difference in [(OR) +95% CI] between linezolid and comparators was observed: positive VRE bacteriuria [0.3 (0.1, 1.9), $P = 0.20$], UTI retreatment [1.8 (0.3, 10.0), $P = 0.49$], death [1.4 (0.1, 16.1), $P = 0.79$].

Conclusion. Most patients with a VRE positive urine culture who received antibiotics did not meet diagnostic criteria for UTI, and negative outcomes were uncommon. Linezolid and comparator regimens with VRE activity were effective for treating mild VRE UTI.

Disclosures. All authors: No reported disclosures.

1471. Medical Claims Analysis as a Tool to Evaluate Empiric and Targeted Antibiotic Therapy in UTIs

Wing Hui, MS; Nuno T. Antunes, PhD; Shriram Veeramani, MS; David Holman, PhD; Decision Resources Group, Toronto, ON, Canada

Session: 157. Urinary Tract Infections
Friday, October 4, 2019: 12:15 PM

Background. Empiric therapy is a mainstay of the inpatient management of urinary tract infections (UTIs), and the choice of empiric antibiotic is shaped by local epidemiology and patient risk factors and comorbidities. Pathogen identification (ID) and antibiotic susceptibility testing (AST) provide information that can guide adjustments in therapy, allowing de-escalation to more targeted, narrow-spectrum antibiotics.

Methods. Real-world data (hospital billing claims) from 2017 was used to extract relevant information from general hospitals on inpatients with bacterial UTIs including patient demographics and antibiotics line of therapy progression. Patients were projected to the USA national event totals and validated with other projection-related data sources (HCUP) and secondary market research. Data obtained in the claims analysis was validated by primary market research (PMR).

Results. Analysis of 33M claims identified 169K patients with a code for UTI; in at least one-third of patients, there were no codes associated with ID/AST assays. Among those with codes for ID/AST assays, the vast majority were performed in the first 3 days following hospital admission. Approximately two-thirds of patients with associated ID/AST codes were already receiving an antibiotic when the assays were performed, which was assumed to be the empiric treatment. Analysis of the line of antibiotic therapy progression in patients where ID/AST was performed identified subsequent changes in antibiotic prescribing in approximately one-third of patients within 3 days, compatible with changes due to delivery of conclusive results and were interpreted as a transition from empiric to targeted treatment.

Conclusion. To the best of our knowledge, this is the first attempt at understanding the impact of ID/AST assays on prescribing practices with basis on analysis of claims data. Our results align with PMR conducted by DRG internally, supporting the validity of this methodology. Although this claims analysis delivers reliable data when claims are associated with ID/AST assays, it is limited by incompletely filled claims, which may underestimate the use of these assays.

Disclosures. All authors: No reported disclosures.

1472. Non-Carbapenems for Treating Community-Associated Urinary Tract Infection Caused by Extended-Spectrum β-Lactamase-Producing Enterobacteriaceae in Children

Hyun Joo Jung, Clinical Assistant Professor; Shin Young Lee, Resident, Kisoo Pai, Professor; Ajou University School of Medicine, Suwon, Kyonggi-do, Republic of Korea

Session: 157. Urinary Tract Infections
Friday, October 4, 2019: 12:15 PM

Background. Childhood urinary tract infection (UTI) may cause increased major morbidity and long-term clinical consequences. Extended-spectrum β-lactamase (ESBL) is produced by the members of the Enterobacteriaceae family, which are the primary infectious agents that cause UTI in children. Isolation of ESBL-producing Enterobacteriaceae (ESBL-E) typically occurred in healthcare facilities; however, the incidence of community-associated (CA) UTIs due to ESBL-E has increased worldwide. It has led to an increase in the use of carbapenems. In this study, we determine the characteristics of community-onset UTIs caused by ESBL-E in children to suggest non-carbapenem options for the treatment of childhood UTIs due to ESBL-E in order to preserve carbapenems.

Methods. A total of 2,157 isolates of ESBL-E were collected from children below 18 years old who were clinically certified UTI or urosepsis between January 2008 and August 2018 at tertiary university hospital in Korea. Their electronic medical records were retrospectively reviewed. Long-term healthcare facility stay within the preceding month and isolates recovered more than 72 hours after hospitalization were the criteria of healthcare-associated (HA) infection.

Results. The most common isolates were *E. coli* 1815 (84.2%) followed by *K. pneumoniae* 342 (15.8%). CA infection was detected in 1,513 of the 2157 ESBL-E (70.1%). The prevalence of CA ESBL-E infection increased significantly from 68 cases in 2008 to 325 cased in 2017. Antibiotic susceptibility test showed highest sensitivity to ertapenem, meropenem, and amikacin (>90%) followed by cefoxitin (82%), and piperacillin–tazobactam (TZP) (80.5%). CA *E. coli* showed higher sensitivity to amikacin and TZP compared with HA *E coli*. CA *K. pneumoniae* showed much higher sensitivity to TZP compared with HA *K. pneumoniae*. Of total ESBL-E, the antimicrobial resistance rate to aminoglycoside such as amikacin and gentamicin showed full sensitivity during the study period; furthermore, a rate of resistance to TZP has been decreasing over the years.

Conclusion. Identifying antibiotic susceptibility patterns of ESBL-E is a useful guide for treatment strategy of UTI. This study showed that there are non-carbapenem options for the treatment of CA ESBL UTI in children.

Disclosures. All authors: No reported disclosures.

1473. Structured Patient Interview in Complicated Urinary Tract Infections to Assess Clinical Outcomes vs. Investigator's Evaluation in the APEKS-cUTI Study

Simon Portsmouth, MD[1]; Kiichiro Toyoizumi, PhD[1]; Tsutae Den Nagata, MD[2]; Glenn S. Tillotson, PhD[3]; Roger Echols, MD[4]; [1]Shionogi Inc., Florham Park, New Jersey; [2]Shionogi & Co. Ltd., Osaka, Osaka, Japan; [3]GST Micro LLC, Henrico, Virginia; [4]Infectious Disease Drug Development Consulting LLC, Easton, Connecticut

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Background. Based on the 2009 US FDA guidance, patient-reported outcome (PRO) measures are recommended in clinical study designs for certain indications to evaluate response to therapy from the patient's perspective, and a PRO was recommended in the final complicated urinary tract infection (cUTI) guidance in 2014. Several PRO tools have been rigorously validated, but currently, no tool exists for evaluating cUTI. We included a "structured patient interview (SPI)" while conducting a randomized, double-blind, study (NCT02321800) investigating cefiderocol (CFDC) vs. imipenem–cilastatin (IPM/CS) in cUTI patients to support the physician's assessment of clinical response.

Methods. Patients, who were fully alert and oriented, were interviewed at randomization, end of treatment, test of cure (TOC), and follow-up (FUP) by the same interviewer. The questionnaire identified the presence or absence of relevant symptoms pertinent to cUTI. Responses were graded as none, or if present, mild, moderate, or severe. Investigator assessment included objective measures of clinical outcome(s) and was performed independently from the patient-reported symptoms collected in the SPI. Changes in the patient's responses were compared with the investigator's assessment at randomization and at each study visit. A kappa correlation coefficient comparing the SPI and physician's clinical assessment was calculated at each evaluation time point.

Results. Based on investigator assessment, 89.7% (226 out of 252 patients) in the CFDC arm and 87.4% (104 out of 119 patients) in the IPM/CS arm achieved clinical cure (adjusted treatment difference: 2.39%; 95% CI: −4.66; 9.44) at TOC. Based on the SPI responses, 89.7% (226 out of 252 patients) in the CFDC arm and 84.9% (101 out of 119 patients) in the IPM/CS arm achieved clinical cure (adjusted treatment difference: 4.96%; 95% CI: −2.48; 12.39) in favor of CFDC. The correlation between SPI evaluation and physician's assessment of clinical outcomes was very high at TOC and FUP visits (Kappa coefficients: 0.820 and 0.766, respectively).

Conclusion. The strong correlation between patients' reported symptoms collected in the SPI and investigator assessment showed that SPI responses could be a useful alternative measure of clinical outcomes in cUTI studies.

Disclosures. All authors: No reported disclosures.

1474. Epidemiology and Outcomes of Hospitalized Patients with Urinary Tract Infections (UTI) Due to Multidrug-Resistant Organisms (MDRO)

Frances J. Lahrman, DO[1]; Margaret A. Olsen, PhD, MPH[2]; Dustin Stwalley, MA[2]; Jason P. Burnham, MD[1]; Jennie H. Kwon, DO, MSCI[3]; [1]Washington University in St. Louis School of Medicine, St. Louis, Missouri; [2]Washington University in St. Louis, Saint Louis, Missouri; [3]Washington University