

Ceftazidime/avibactam utilization in the national Veterans Affairs (VA) Healthcare System

Aisling R Caffrey¹⁻⁴, Haley J Appaneal¹⁻⁴, Vrishali V Lopes¹, Kerry L LaPlante^{1,2,3,5}

¹Infectious Diseases Research Program, Providence Veterans Affairs Medical Center, Providence, RI;

²Center of Innovation in Long-Term Support Services, Providence Veterans Affairs Medical Center, Providence, RI;

³College of Pharmacy, University of Rhode Island, Kingston, RI; ⁴School of Public Health, Brown University, Providence, RI;

⁵Warren Alpert Medical School of Brown University, Division of Infectious Diseases, Providence, RI.



BACKGROUND

Multidrug-resistant infections are challenging to treat, due to underlying patient conditions, pathogen characteristics, and high resistance rates to antibiotic treatments. Ceftazidime/avibactam (CAZ-AVI, approved in 2015) is approved to treat complicated intra-abdominal infections, complicated urinary tract infections, hospital-acquired bacterial pneumonia, and ventilator-associated bacterial pneumonia. As newer antibiotic therapies come to market, limited data exist about their use in real-world practice. Therefore, we sought to describe the utilization of CAZ-AVI in clinical practice.

METHODS

This national retrospective cohort study included hospitalized VA patients receiving CAZ-AVI from 2015 through 2021. Cultures, infection diagnoses, demographics, comorbidities, treatments, and clinical outcomes were assessed in this cohort.

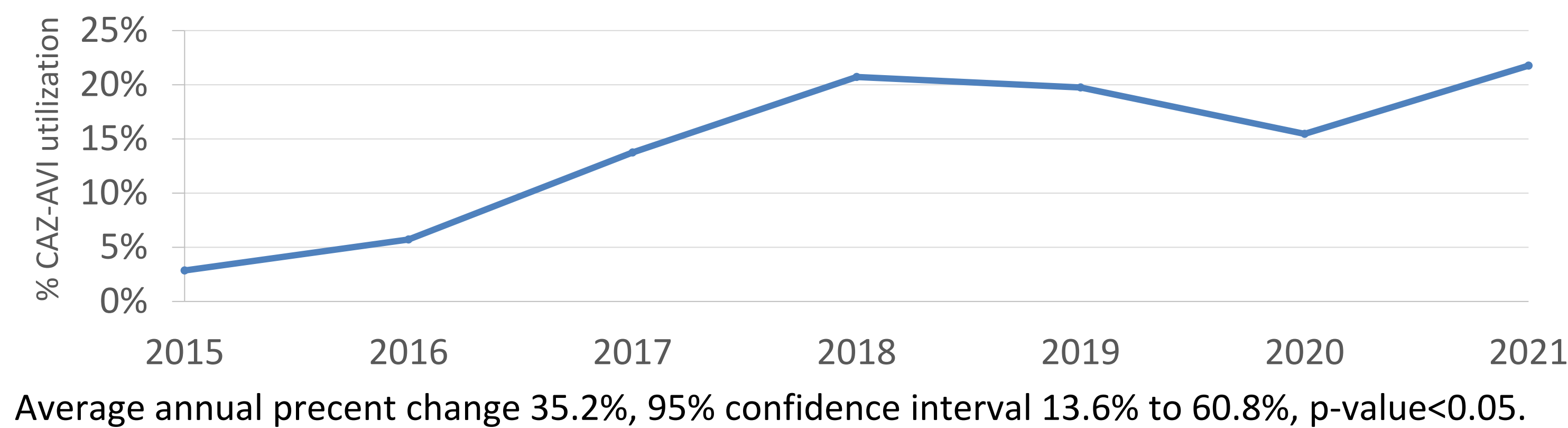
RESULTS

Demographics	N=1,048
Age (years), mean (SD)	71.5 (11.9)
Male	1,030 (98.3%)
Race	
White	694 (66.2%)
Black/African American	290 (27.7%)
Asian or American Indian/Alaska Native	13 (1.2%)
American Indian/Alaska Native	9 (0.9%)
Other/unknown	51 (4.9%)
Hispanic	350 (33.4%)
Charlson score, median (IQR)	5 (3-7)
Admit from home/community	818 (78.1%)
Admitted to medical treating specialty	482 (46.0%)
Intensive care during admission	322 (30.7%)
Infections in past 3 months	492 (47.0%)
Organisms	
<i>Pseudomonas aeruginosa</i>	380 (36.3%)
Carb-R, ESC-R, MDR	80.6%, 64.5%, 65.0%
<i>Klebsiella</i>	357 (34.1%)
Carb-R, ESC-R	78.4%, 90.7%
<i>Escherichia coli</i>	133 (12.7%)
Carb-R, ESC-R	19.0%, 72.7%
<i>Enterococcus</i>	119 (11.4%)
Others	326 (31.1%)

Carb-R = carbapenem-resistant, ESC-R = extended spectrum cephalosporin-resistant, MDR = multidrug resistant

RESULTS

Treatment and outcomes	N=1,048
Time to CAZ-AVI initiation from admission (days), median (interquartile range)	6.0 (2.0-29.0)
CAZ-AVI treatment duration (days), median (IQR)	8.0 (3.0-13.0)
Length of hospital stay (days), median (IQR)	
From admission date	29.0 (11.0-74.0)
From CAZ-AVI initiation	14.0 (7.0-40.5)
Number of antibiotic changes prior to CAZ-AVI initiation, median (IQR)	3 (2-6)
Treatment heterogeneity prior to CAZ-AVI initiation	759 (89.6%)
Concomitant antibiotics during CAZ-AVI treatment	
Vancomycin	434 (41.4%)
Meropenem	253 (24.1%)
Cefepime	159 (15.2%)
Piperacillin/tazobactam	159 (15.2%)
Daptomycin	109 (10.4%)
Inpatient mortality	247 (23.6%)
Mortality within 30 days of CAZ-AVI initiation	190 (18.1%)



CONCLUSIONS

Utilization of CAZ-AVI increased from 2015 to 2018 and has since stabilized in the national VA Healthcare System. CAZ-AVI has been utilized in complex, difficult-to-treat patients with highly resistant organisms. We observed substantial treatment heterogeneity and variation in causative organism and culture site. Only 30 shared patterns were identified in 135 of the patients treated with CAZ-AVI (12.9%; Figure 1). Among patients with 7 or more changes in therapy (n=47, 4.5%; Figure 2), CAZ-AVI was often not initiated until the 5th or 6th change in therapy.

Contact: Aisling_Caffrey@uri.edu

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RESULTS

Figure 1: Top 30 antibiotic treatment patterns (n=135 patients) from admission through treatment with ceftazidime/avibactam.

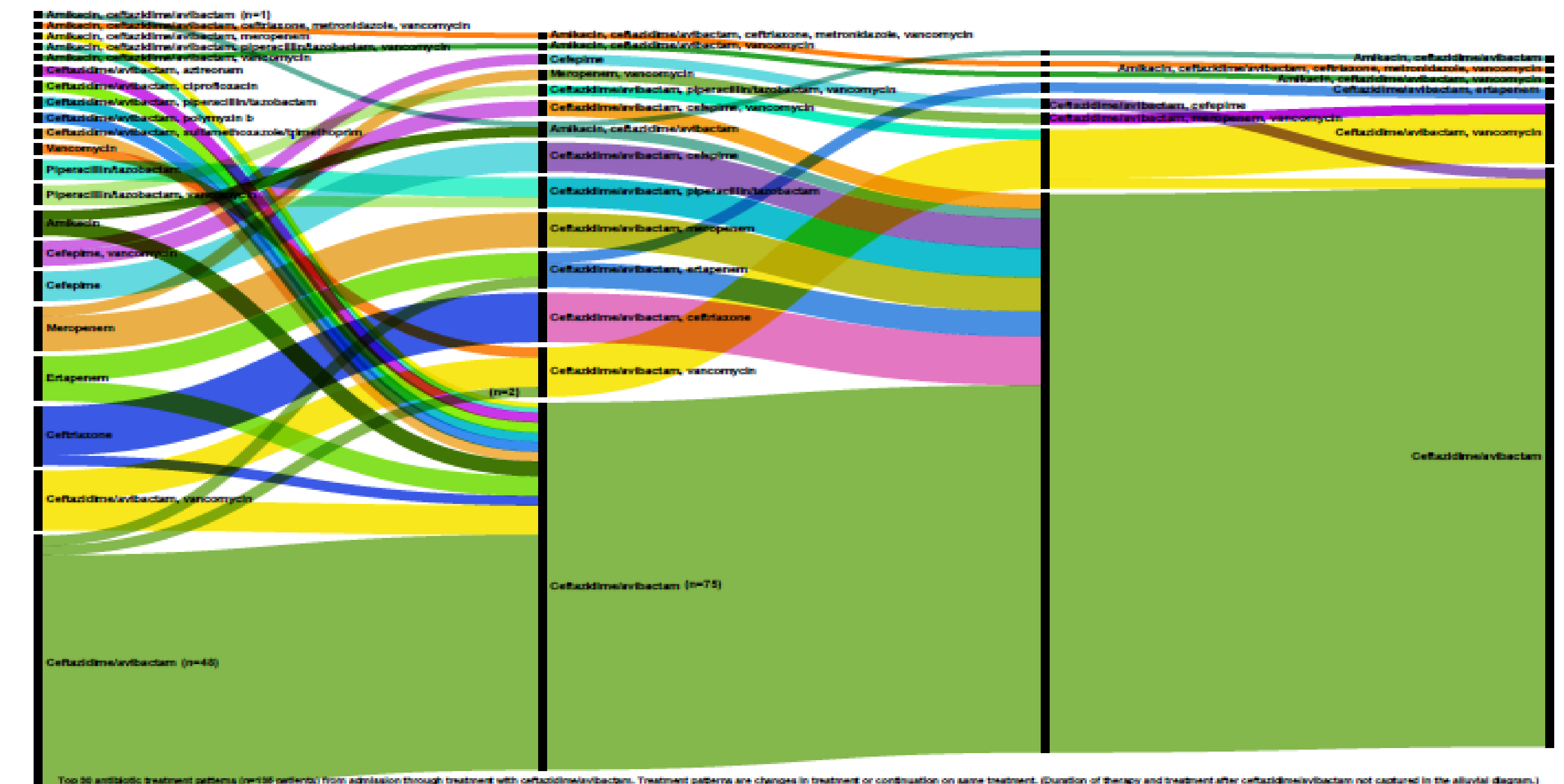
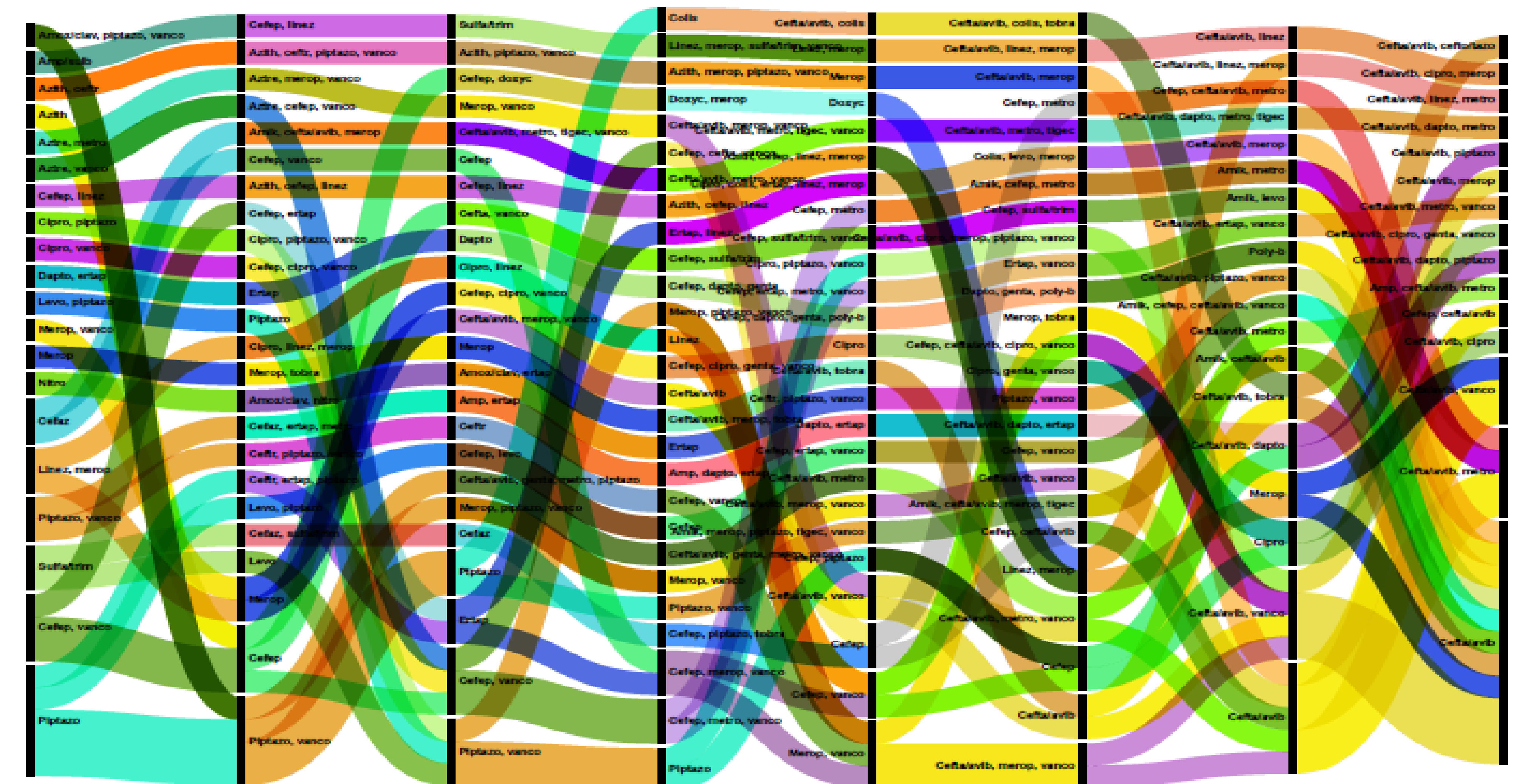


Figure 2: Unique treatments patterns among those with 7 changes in therapy (n=30 randomly selected patients of 47) from admission through treatment with ceftazidime/avibactam.



30 unique treatment patterns among those with 7 changes in therapy (n=30 randomly selected patients of 47) from admission through treatment with ceftazidime/avibactam. (Duration of therapy and treatment after ceftazidime/avibactam not captured in the alluvial diagram.)