RES-171

APCCMI2025 BANGKOK

Real-World Usage, Efficacy, and Microbiological Features of Ceftazidime-Avibactam in Clinical Practice in China

Xiaohua Qin[1,*], Tianxin Xiang[2], Xiaoju Zhang[3], Xuzhu Ma[4], Weifeng Zhao[5], Yunsong Yu[6], Caiyan Zhao[7], Liang Gao[8], Lifen Li[9], Tiantian Wang[10], Chongjie Pang[11], Felix Cao[12], Ming Su[13], Junchao Lu[13], Wenjuan Xu[12], Shan Yin[13], Danni Lu[13], Xinyu Yang[12], Minggui Wang[1]

[1]Institute of Antibiotics, Huashan Hospital, Fudan University, Shanghai, China; [2]Department of Infectious Diseases, The First Affiliated Hospital of Nanchang University, Nanchang, Jiangxi Province, China; [3]Department of Pulmonary and Critical Care Medicine, Henan Provincial People's Hospital, Zhengzhou, Henan Province, China; [4]Department of Infectious Diseases, Beijing Tsinghua Changgung Hospital, Tsinghua University, Beijing, China; [5]Department of Infectious Diseases, The First Affiliated Hospital of Soochow University, Suzhou, Jiangsu Province, China; [6]Department of Liver Diseases and Infectious Diseases, Sir Run Run Shaw Hospital, Zhejiang University School of Medicine, Hangzhou, Zhejiang, China; [7]Department of Infectious Diseases, The Third Hospital of Hebei Medical University, Shijiazhuang, Hebei Province, China; [8]Department of Neurosurgery, Shanghai Tenth People's Hospital, Shanghai, China; [9]Department of Critical Care Medicine, The First Affiliated Hospital of Sun Yat - sen University, Guangzhou, Guangdong Province, China; [10]Department of Hematology, The People's Hospital Affiliated to Ningbo University, Ningbo, Zhejiang Province, China; [11]Department of Infectious Diseases, Tianjin Medical University General Hospital, Tianjin, China; [12]China Medical, Pfizer Inc, Beijing, China

[13]China Medical, Pfizer Inc, Shanghai, China

Background and Objectives

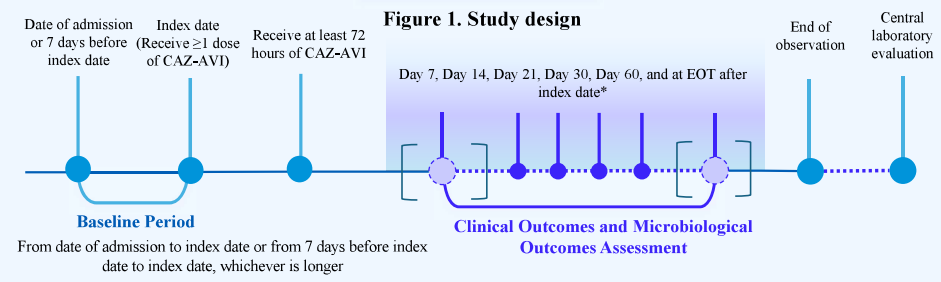
- Infections caused by multidrug-resistant gram-negative bacilli (MDR-GNB) and extensively drug-resistant gram-negative bacilli (XDR-GNB) are difficult-to-treat and associated with high morbidity, mortality, and increased medical burden, poseing a serious public health problem and highlighting the urgent need for new antimicrobial agents against MDR-GNB[1,2]
- **Ceftazidime-avibactam (CAZ-AVI)** has been increasingly used in treating infections caused by multidrug-resistant (MDR) pathogens[1,3]
- This study was conducted to characterize the real-world usage of CAZ-AVI in China

Methods

Study design

- This **multicenter prospective observational study** enrolled hospitalized adult patients who received ≥1 dose of CAZ-AVI in China
- Clinical data were collected from the time of the first dose of CAZ-AVI until death, withdrawal of the study, or 60 days following hospital discharge (whichever came first) (Figure 1)
- **Clinical and microbiological outcomes** were evaluated among patients with **≥72 hours of CAZ-AVI treatment** at **end of treatment (EOT)**

Figure 1. Study design



*If the patients has not been discharged before the time point, the outcome are assessed at each time point. A 3-day identification windows is applied before and after each time point.

Critical enrollment criteria

- Initiate ≥1 dose of CAZ-AVI during hospitalization
- Aged ≥ 18 years old at the time of the informed consent signature

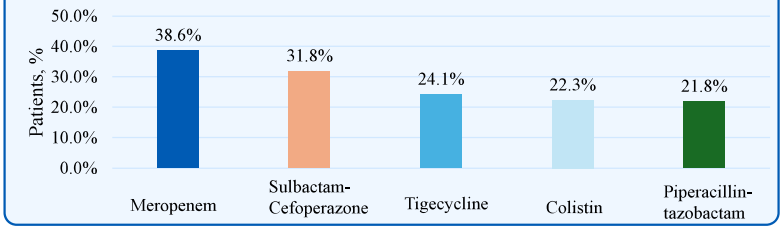
Results

- A total of **220** adult patients meeting the eligibility criteria were enrolled from 20 October 2022 to 29 February 2024, of whom **214** received a treatment of CAZ-AVI for at least 72 hours
- 150/220 (68.2%) patients were male, with a **mean age** of **62.4 (±16.7)** years (Table 1)
- The most common CAZ-AVI indications were **pneumonia (142/220, 64.5%)**, **complicated intra-abdominal infection (cIAI) (37/220, 16.8%)** and **bloodstream infection (16/220, 7.3%)**

Table 1. Baseline characteristics of patients (n=220)

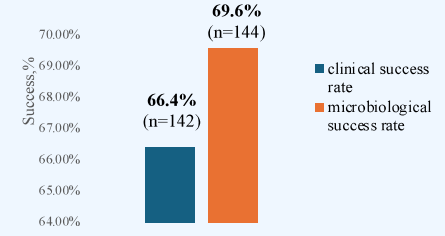
Age, years (±SD)	62.4 (16.7)
Sex, n (%)	
Male	150 (68.2)
Female	70 (31.8)
BMI, kg/m² (±SD)	22.5 (4.0)
DCCI score (±SD)	3.8 (3.3)
APACHE II score	20.7 (8.4)
SOFA score	8.5 (4.5)
Risk factor, n (%)	
Glucocorticoids (≥10 mg Prednisone daily)	43 (19.5)
Immunosuppressants	27 (12.3)
Hypoalbuminemia(<30 g/L)	115 (52.3)
History of radiotherapy/chemotherapy	18 (8.2)
Leukopenia	9 (4.1)
Medications received within 30 days prior to initiation of CAZ-AVI	145 (65.9)

Figure 2. Antibiotic treatment for current infection before CAZ-AVI (n=220)



- The majority of patients had **received other antibiotics for the current infection prior to the initiation of CAZ-AVI (n=180, 81.8%);** the most frequently reported was **meropenem (n=85, 38.6%)** (Figure 2)
- 75% of patients received **definitive therapy of CAZ-AVI**, while 25% received empiric therapy
- **The average (±SD) duration of** CAZ-AVI use was **13.7 (9.89) days**
- 80.0% (n=176) of patients received CAZ-AVI in combination with other antibiotics, most commonly with **tigecycline (68/220, 30.9%)** was followed by **colistin (45/220, 20.5%)** and **vancomycin (35/220, 15.9%)**

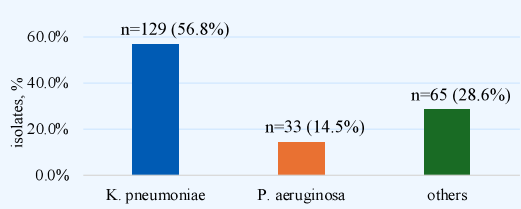
Figure 4 Clinical Success Rate (Clinically Evaluable Analysis Set*, n=214) and Microbiological Success Rate (Microbiologically Evaluable Analysis Set†, n=208) at EOT



*Includes all patients who received at least 72 hours of CAZ-AVI with at least 1 non-missing clinical outcome.
† Includes all patients who received at least 72 hours of CAZAVI and had at least 1 non-missing microbiological outcome.

- Overall, **227** pathogens were isolated, wherein 95 were delivered and analyzed at the central laboratory
- ***K. pneumoniae*** (129 isolates, 56.8%) was the most identified pathogen, followed by ***P. aeruginosa*** (33 isolates, 14.5%) (Figure 3)
- Among 116 *K. pneumoniae* isolates tested, **101 (87.1%)** were **resistant to meropenem**; among 25 *P. aeruginosa* isolates tested, **18 (72.0%)** were resistant.
- **51 out of 52** carbapenemase-producing *K. pneumoniae* isolates carried Serine-β-lactamase gene (one remained undetermined), and **6 of them co-harbored Metallo-β-lactamase genes**.

Figure 3. Microbiological results at baseline (n=227)



- The median length of hospital stay (LOS) was **36.0** days and the median LOS in intensive care unit was **25.0** days; the all-cause in-hospital mortality was **9.8%**
- At EOT (Figure 4):
  - ❑ Among 214 patients who received CAZ-AVI for at least 72 hours and were included in the clinically evaluable analysis set**, clinical success was achieved in 66.4%**
  - ❑ Among 208 patients who received CAZ-AVI for at least 72 hours and were included in the microbiologically evaluable analysis set**, microbiological success was achieved in 69.6%**

Conclusion

- This is the **largest real-world study** of **CAZ-AVI** in **China**, focusing on it use in Chinese patients
- This study provides valuable data on real-world use of CAZ-AVI in China, highlighting its role as an effective treatment for MDR pathogens

Reference: 1. Soriano, A., *et al. Infect Dis Ther* **12**, 891–917 (2023). 2. Cantón R, *et al. Clin Microbiol Infect.* 2012;18(5):413–31.
3. Piroth L, et al. Infectious Diseases Now 2025;55(2):105036

Abbreviation : APACHE. Acute Physiology and Chronic Health Evaluation; BMI, body-mass Index; CAI, community-acquired infection; CAP , community-acquired pneumonia; CAZ-AVI, ceftazidime/avibactam ; cIAI, complicated intra-abdominal infection; DCCI, Deyo-Charlson comorbidity index; EOT, end of treatment; HAI, hospital-acquired infection; HAP, hospital-acquired pneumonia; LOS, length of hospital stay; MDR-GNB, multidrug-resistant gram-negative bacteria; SD standard deviation; SOAF, Sequential Organ Failure Assessment; TID, three times a day; VAP, Ventilator associated pneumonia; XDR-GNB, extensively drug-resistant gram-negative bacteria

Disclosures: This study was sponsored by Pfizer Inc. X Qin, T Xiang, X Zhang, X Ma, W Zhao, Y Yu, C Zhao, L Gao, L Li, T Wang, C Pang and M Wang declared that they have no competing interests. F Cao, M Su, J Lu, S Yin, D Lu and X Yang are employees of Pfizer Inc. and may hold stock/stock options in Pfizer. W Xu was an employee of Pfizer Inc. at the time this study was conducted. Medical writing assistance was provided by Pfizer Inc.