

Antimicrobial Resistance in Taiwan During COVID-19 Pandemic

Chien-Ming Chao 

Department of Intensive Care Medicine, Chi Mei Medical Center, Liouying, Tainan, Taiwan

Dear Editor,

Coinfection or secondary infection is not uncommon for COVID-19 patients, especially for patients with a critical illness (1). The appropriate antibiotic should be indicated for the population, however, we should also seriously concerned about another important issue about the possible altered antimicrobial resistance due to the increasing use of antibiotics during the COVID-19 pandemic (2-4). Therefore, we conducted this study to assess the change of antibiotic resistance before and after the COVID-19 outbreak using an open database-Taiwan Nosocomial Infection surveillance System (TNIS).

The TNIS was launched by Taiwan Centers for Disease Control in 2007, which aimed to monitor the occurrence of healthcare-associated infections (HAIs) and to assess the

epidemiologic trends of HAIs. In addition to HAI, this system also provided the antimicrobial susceptibility results from reporting hospitals, including a medical center and regional hospitals. This study used the recent report of TNIS, which showed the surveillance results of HAI and associated antimicrobial resistance to this June, for analysis (5). Percentage (%) change was defined as the difference in the number of antibiotic resistance rates between 2020 and 2019, divided by the resistance rate in 2019 and multiplied by 100.

First, this summary of antibiotic resistance among the clinical isolates causing HAIs in the medical center's intensive care unit (ICU) collected between January and July 2020 showed carbapenem-resistance rate among clinical isolates of *Acinetobacter baumannii*,

Corresponding Author: Chien-Ming Chao; Department of Intensive Care, Chi-Mei Medical Center, Liouying, Taiwan

ORCID ID: 0000-0003-0235-9060

E-mail: ccm870958@yahoo.com.tw

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Enterobacteriaceae, *Escherichia coli*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa* were 75.2%, 26%, 1.5%, 46.7%, and 17.4%, respectively. Vancomycin-resistance among *E. faecium* and Enterococci was 45.6% and 67.8%, respectively. Methicillin-resistance rate among *Staphylococcus aureus* was 54.5% (Table 1). Second, the findings in regional hospital's ICU showed carbapenem-resistance among clinical isolates of *A. baumannii*, Enterobacteriaceae, *E. coli*, *K. pneumoniae*, and *P. aeruginosa* were 75.5%, 19.2%, 4.2%, 33.1%, and 16.5%, respectively. Vancomycin-resistance among Enterococci and *E. faecium* was 37.8% and 57.5%, respectively. Methicillin-resistance rate among *S. aureus* was 61%. Third, the change of antibiotic resistance rate between 2019 and the first half of 2020 showed carbapenem-resistance rate among *A. baumannii*, Enterobacteriaceae, and *K. pneumoniae* had an increase in the medical center from 2019 to 2020. In contrast, another kind of antibiotic resistance rate had decreased from 2019 to 2020. Finally, a similar trend was observed in a regional hospital. The only carbapenem-

resistance among *A. baumannii* had increased, but other antibiotic-resistant had decreased.

In this letter, we shared the increasing carbapenem-resistant rate during the COVID-19 pandemic among the clinical *A. baumannii* isolates in the ICU in both medical centers and regional hospitals. Besides, the carbapenem-resistant rate among *K. pneumoniae* isolates was found to be increasing in medical centers' ICU. In contrast, we observed the resistance rates were decreasing for the carbapenem against *E. coli* and *P. aeruginosa*, vancomycin against Enterococci, and methicillin-against *S. aureus* isolates collected in both medical center and regional hospitals' ICUs. Our findings suggest that we should keep on appropriate antibiotic prescribing practices according to antimicrobial stewardship programmers, the use of carbapenem in Taiwan particularly. Besides, the regular monitoring of antimicrobial resistance results in each hospital is helping to establish the epidemiologic database for the clinicians' reference in the prescribing of antimicrobial agents. However, our finding was just based on short-term surveillance. Further

Table 1. Antibiotic resistance rate among clinical isolates causing healthcare-associated infection in 2019 and first half of 2020 in Taiwan

Variables	Antibiotic-resistant rate (%)					
	Medical center			Regional hospital		
	2019	2020	Change (%)	2019	2020	Change (%)
Carbapenem-resistant rate						
<i>A. baumannii</i>	74.6	75.2	0.8	70.4	75.5	7.3
Enterobacteriaceae	23.6	26.0	10.2	20.0	19.2	-4.0
<i>E. coli</i>	3.2	1.5	-53.1	4.9	4.2	-14.3
<i>K. pneumoniae</i>	39.8	46.7	17.3	34.3	33.1	-3.5
<i>P. aeruginosa</i>	24.8	17.4	-29.8	17.9	16.5	-7.8
Vancomycin-resistant rate						
Enterococci	48.1	45.6	-5.2	46.9	37.8	-19.4
<i>E. faecium</i>	68.4	67.8	-0.9	70.9	57.5	-18.9
Methicillin-resistant rate						
<i>S. aureus</i>	62.4	54.5	-12.7	62.7	61.0	-2.7

long-term assessment of the impact of COVID-19 on antimicrobial resistance is warranted.

Conflict of Interest

The author declares no competing interests.

References

1. Lai CC, Wang CY, Hsueh PR. Co-infections among patients with COVID-19: The need for combination therapy with non-anti-SARS-CoV-2 agents? *J Microbiol Immunol Infect* 2020;53(4):505-512
2. Gonzalez-Zorn B. Antibiotic use in the COVID-19 crisis in Spain. *Clin Microbiol Infect* 2020 Nov 18;S1198-743X(20)30609-1
3. Ruiz J. Enhanced antibiotic resistance as a collateral COVID-19 pandemic effect? *J Hosp Infect* 2020 Nov 17;S0195-6701(20)30524-7
4. Chibabhai V, Duse AG, Perovic O, Richards GA. The collateral damage of the COVID-19 pandemic: Exacerbation of antimicrobial resistance and disruptions to antimicrobial stewardship programs? *S Afr Med J* 2020;110:572-3
5. Taiwan Centers for Disease Control. https://www.cdc.gov.tw/File/Get/sqrAKrJg_Uq8Ki5B0HtO3g?path=C_rEhWX_clvurxnL9WQhEqxl1a7pa53jnCNLMVBsVajsKVNXYEgvuoiuF2518Ayg&name=8Tz0-xqvc_ePRqgyTaTUF_7IY4X6Tv5Nd5U3DqXehIFKVffarzl374ceBO3CQOxo4pblzzOKBfbGvuBzLMRGMh9nnhyUwSKC8GMyrzZGuD3Ls461ppglxYkQF4i-kHrTE3P14gExT6vrw2_GC1xA. Accessed on December 3, 2020

Contact Details

Chien-Ming Chao

Department of Intensive Care Medicine,
Chi Mei Medical Center, Liouying, Taiwan
E-mail: ccm870958@yahoo.com.tw
ORCID ID: 0000-0003-0235-9060

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