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904. OUTCOMES RESEARCH-NON-MALIGNANT CONDITIONS

Mortality Risk and the Clinical Outcome of Carbapenem-Resistant Enterobacteriaceae Carriers with Neutropenia: A Matched Case-Control Study

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Patients with hematologic diseases are often accompanied by immunodeficiency, treatments as well as the disease itself can lead to granulocyte deficiency. Patients with granulocyte deficiency are under the high risk of infection. In recent years, the rate of Carbapenem-resistant Enterobacteriaceae (CRE) infection has gradually increased. Treatment options of CRE infection is limited, and effective anti-infection treatment is usually delayed, leading to the death of patients due to infection. CRE screening can provide clinical evidence for early detection of CRE by clinicians, thereby formulating antimicrobial treatment strategies. However, whether the initial empirical treatment covering CRE can improve the adverse outcomes of patients still lacks a definitive conclusion.

We collected clinical data on patients with neutropenia who also undergoing CRE screening between January 2017 and December 2022. To further analyze the impact of CRE positivity on patient mortality risk and the clinical effectiveness of initial empirical treatment for CRE, we conducted two case-cohort studies with clinical baseline data matching.

In total, we performed 3529 fecal CRE screenings from 664 patients. Out of these, 345 screenings from 135 patients tested positive for CRE. We identified 16 different strains, with the most common being *Klebsiella pneumoniae* (184/345), followed by *Escherichia coli* (76/345). To determine the influence of CRE positivity on patient mortality rates, we conducted a 1:2 case matching based on age, gender, diagnosis, and medical history of CRE-positive patients (Table 1). The results showed that in the overall analysis, CRE positivity, age over 60, and male gender were adverse factors influencing mortality. However, in the subgroup analysis of CRE-positive patients, no adverse factors affecting mortality were observed.

To further assess the impact of CRE positivity on patient infection outcomes, we defined the initial antibiotic treatment strategies for a total of 4,872 infection events in screened patients. We divided them into the following groups: the empirical treatment group without CRE results ($n=3,954$), the empirical treatment group not covering CRE ($n=122$), and the CRE based empirical treatment group ($n=796$). The CRE based empirical treatment group had a higher success rate in initial empirical treatment compared to the group without covering CRE (65.5% vs. 59.0%).

To further investigate the differences in initial empirical treatment success rates and 30-day mortality rates between patients in the CRE-based empirical treatment group and empirical treatment group without CRE covering, we performed 1:2 case matching for clinical baseline data on age, sex, diagnosis, past history, and disease status at infection according to the clinical characteristics of the CRE-based anti-infection treatment group. The results indicated that there were no significant differences in initial empirical treatment success rate and 30-day mortality rate between the CRE-based empirical treatment group and case-matched controls.

In conclusion, diagnosing and treating patients with CRE infection presents significant challenges. Early screening for CRE and empirical treatment targeting CRE can increase the success rate of initial empirical treatment in CRE-positive patients.

Disclosures No relevant conflicts of interest to declare.

Table 1. Comparison of clinical characteristics between CRE positive patients and CRE negative case-control patients

Clinical characteristics		CRE+ (n=135)	CRE- (n=270)	P-value
Gender	Male	73	146	1
	Female	62	124	
Age	>60	70	140	1
	≤60	65	130	
Disease	AML	79	158	1
	DLBCL	21	42	
	MM	22	44	
	MDS	13	26	
	Diabetes	17	24	
Underlying disease	Hypertension	35	51	0.1
	Chronic kidney disease	10	11	
	Chronic liver disease	12	19	
	Connective tissue diseases	27	52	

Table 2 Univariate analysis of risk factors for all-cause mortality at end of follow-up

Risk Factors	All group (n=405)			CRE+ Group (n=135)			CRE- Group			
	Alive	Dead	P value	Alive	Dead	P value	Alive	Dead	P value	
CRE	positive	53	82	0.04	-	-	-	-	-	
	negative	135	135		-	-	-	-	-	
Age	>60	107	103	0.06	28	42	0.86	79	61	0.04
	≤60	81	114		25	40		56	74	
Gender	Male	88	131	0.006	27	46	0.56	61	85	0.005
	Female	100	86		26	36		74	50	
Disease	AML	119	118	0.33	31	48	0.88	88	70	0.15
	DLBCL	26	37		7	14		19	23	
	MM	28	38		10	12		18	26	
	MDS	15	24		5	8		10	16	

Figure 1

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