

# Importance of New Delhi Metallo- $\beta$ -Lactamase *Klebsiella pneumoniae* surveillance in ICU: first case series in Northern Italy

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## INTRODUCTION

Multidrug-resistant (MDRs) infections are a major problem, especially in Intensive care Units (ICU). In Italy it concerns particularly the carbapenemase-producing *Klebsiella pneumoniae* (CP-Kp). Recently, several outbreaks of phenotypes extensively resistant such as New Delhi  $\beta$ -lactamase (NDM) have been described in Florence and Lazio<sup>1-2</sup>.

## RESULTS

90 patients were studied: 9 had positive rectal swab for Kp-NDM; 5 developed an invasive infection. All were critically ill (median SAPSII score 50) and had a previous Gram-negative infection treated with broad-spectrum antibiotics. Median time between ICU-admission and NDM-Kp colonization and infections were respectively 10 and 19 days. 3 patients had ventilator-associated pneumonia (VAP), in 2 cases associated with bloodstream-infection (BSI); 1 BSI; 1 peritonitis. 3 patients were treated with Cefiderocol (target therapy); one showed clinical improvement after source control in the absence of target therapy; one patient received empiric therapy (Meropenem/Vaborbactam) with subsequent clinical failure. All the three patients treated with Cefiderocol improved in the first week, with complete recovery within 14 days. In this group, the 28-days mortality was 0% (table 1).

## METHODS

All patients admitted to the ICU of the 'Città della Salute e della Scienza' university hospital between January and March 2023 received weekly surveillance cultures (rectal swab, tracheal aspirate, urine). Other microbiological exams were performed on clinical judgement. Isolates were identified by MALDI-TOF/MS and screened for carbapenemase production by lateral flow immunoassay or molecular tests. Antimicrobial susceptibility was determined by a microdilution assay according to EUCAST breakpoint.

Patient	Age	Sex	Diagnosis on admission	Surgery (1 Yes; 0 No)	SAPSII	Time to colonization	NDM infection (1 Yes; 0 No)	Time to infection	Site	2 <sup>nd</sup> Resistance	Treatment	Choice of antibiotic*	Outcome 7 days°	28 day mortality
1	63	M	Septic shock for meningococemia	0	47	10	0	-	-	-	-	-	-	0
2	86	M	Drainage of empyema	1	41	6	1	8	VAP	-	Meropenem/ Vaborbactam	E	D	1
3	72	M	Addominal aortic repair	1	51	37	1	49	VAP+BSI	CTX-M	Cefiderocol	T	I	0
4	55	M	Septic shock for mediastinitis	1	56	3	1	33	BSI	KPC	Source control	-	I	0
5	22	F	Septic shock for CAP	0	50	6	1	8	VAP+BSI	KPC	Cefiderocol	T	I	0
6	73	M	Peritonitis after anastomotic dehiscence	1	48	19	1	19	Peritonitis	CTX-M	Cefiderocol	T	I	0
7	63	M	VAP after CABG	1	58	5	0	-	-	-	-	-	-	0
8	74	F	Metabolic coma	0	67	120	0	-	-	KPC	-	-	-	0
9	70	M	ARF after haematologic CAR-T	0	31	11	0	-	-	-	-	-	-	0
Median	70	-	-	-	50	10	-	19	-	-	-	-	-	-

Table 1. Characteristics of ICU-admitted patients with NDM colonization/infection. \* E Empiric therapy; T Target Therapy ° I Improvement; D deceased

## CONCLUSION

This first case-series of NDM-Kp colonization/infection in Northern-Italy confirms that a correct discrimination between colonization and invasive infection is crucial especially when treatment options are scarce. While it might be useful to investigate the possible correlation between severity scores at admission, previous infection and antimicrobial treatment, our experience seems to suggest the efficacy of Cefiderocol especially if administered promptly and in targeted modality.

## REFERENCES

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