FIRST REPORT OF METALLO-β-LACTAMASE PRODUCING *PSEUDOMONAS AERUGINOSA* FROM TANZANIA

Sabrina Moyo[1,2], Bjørg Haldorsen[3], Said Aboud[2], Bjørn Blomberg[1], Samuel Maselle[2], Arnfinn Sundsfjord[3,4], Nina Langeland[1], and Ørjan Samuelsen[3]

[1]Institute of Medicine, University of Bergen, N-5021 Bergen, Norway, [2]Department of Microbiology and Immunology, Muhimbili University of Health and Allied Sciences, Tanzania, [3]Reference Centre for Detection of Antimicrobial Resistance, Department of Microbiology and Infection Control, University Hospital of North Norway, Tromsø, Norway, [4]Research Group for Host-Microbe Interactions, Department of Medical Biology, Faculty of Health Sciences, University of Tromsø, Tromsø, Norway.

INTRODUCTION AND PURPOSE

❖Carbapenemases are now disseminating worldwide among clinically important Gram-negative pathogens.

❖Epidemiological data from Africa and particularly from the Sub-Saharan Africa are limited.

❖The aim of the current study was to investigate the presence of carbapenemases among clinical isolates of *Pseudomonas aeruginosa* from Tanzania.

METHODS

❖The study included 90 clinical isolates of *Pseudomonas* species isolated from pus, blood and urine specimens from May 2010 to July 2011 at the Muhimbili National Hospital in Dar-es-Salaam, Tanzania.

❖Antimicrobial susceptibility testing was performed by disc diffusion and E-tests.

❖Carbapenem-resistant isolates were characterised using PCR assays for detection of carbapenemase and extended-spectrum β-lactamase (ESBL)-genes, pulsed-field gel electrophoresis (PFGE), targeted multi-locus sequence typing (MLST), and serotyping.

RESULTS

❖A total of 30 (33.3%), 16 (17.8%), and 15 (16.7%) isolates were from outpatient clinics, burn unit, and surgical wards respectively, while 29 (32.2%) altogether came from the paediatric-, medical-, psychiatric wards, ICU, ENT, or EMD.

❖Eight isolates (8.9%) were carbapenem-resistant and positive for the metallo-β-lactamase (MBL) VIM-2. None of the VIM-2-positive isolates contained GES, PER, or VEB ESBL genes. All isolates were from children.

❖The VIM-2-positive isolates showed broad-spectrum β-lactam resistance with the exception of aztreonam (Table 1). Co-resistance or intermediate susceptibility were observed against gentamicin, tobramycin, amikacin, and trimethoprim-sulfamethoxazole. All isolates were susceptible to ciprofloxacin and colistin (Table 1).

❖PFGE showed 4 different profiles (A, B, C, and D) with two clinical isolates belonging to each profile. MLST of 4 clinical isolates corresponding to each profile showed that 3 isolates belonged to sequence type (ST) 244 and one isolate to ST640 (Table 1).

❖None of the isolates were typeable by serotyping.

Table 1. VIM-producing *P. aeruginosa* from Tanzania.

		Antimicrobial susceptibility (MIC; mg/L)														
ID	Specimen	PP	PTc	TZ	AT	IP	MP	GM	AK	TM	CO	TS	TGC	CI	PFGE	MLST
P3-66	Blood	128	128	64	8	>32	>32	32	32	16	1	>32	8	0.125	A	
P3-70	Pus	128	128	64	8	>32	>32	32	16	16	1	>32	8	0.25	B	ST244
P3-72	Pus	256	128	64	8	>32	>32	32	16	16	1	>32	8	0.125	B	
P3-73	Pus	64	64	64	2	>32	4	64	32	32	2	>32	16	0.25	C	ST640
P3-74	Pus	128	128	64	4	>32	>32	128	64	32	2	>32	32	0.25	D	ST244
P3-75	Pus	128	128	128	4	>32	>32	64	32	32	2	>32	32	0.125	D	
P3-76	Blood	128	128	64	8	>32	>32	32	16	16	1	>32	8	0.125	A	ST244
P3-77	Blood	128	128	64	4	>32	>32	64	32	32	2	>32	16	0.25	C	

PP: piperacillin; PTc: piperacillin-tazobactam; TZ: ceftazidime; AT: aztreonam; IP: imipenem; MP: meropenem; GM: gentamicin; AK: amikacin; TM: tobramycin; CO: colistin TS: trimethoprim-sulfamethoxazole; TGC: tigecycline; CI: ciprofloxacin

CONCLUSIONS

❖This study to our knowledge is the first report of MBL-producing *P. aeruginosa* from Tanzania and adds further evidence on the global dissemination of MBL-carbapenemases.

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