

Parvimonas micra, a new potential pathogen in hospitalized patients: A case series from 2015-2022

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Background *Parvimonas micra* is a gram-positive, anaerobic coccus that is part of the human oropharyngeal and gastrointestinal flora. Infections by *P. micra* are usually polymicrobial and the role of this microorganism as pathogen is still debated. We describe here the epidemiology, the management and the clinical outcome of *P. micra* infections in hospitalized patients.

Methods We included in this analysis 132 hospitalized patients at 4 public hospitals in Southern Switzerland (Lugano, Bellinzona, Mendrisio and Locarno) with a documented infection by *P. micra* diagnosed from 2015 to 2022.

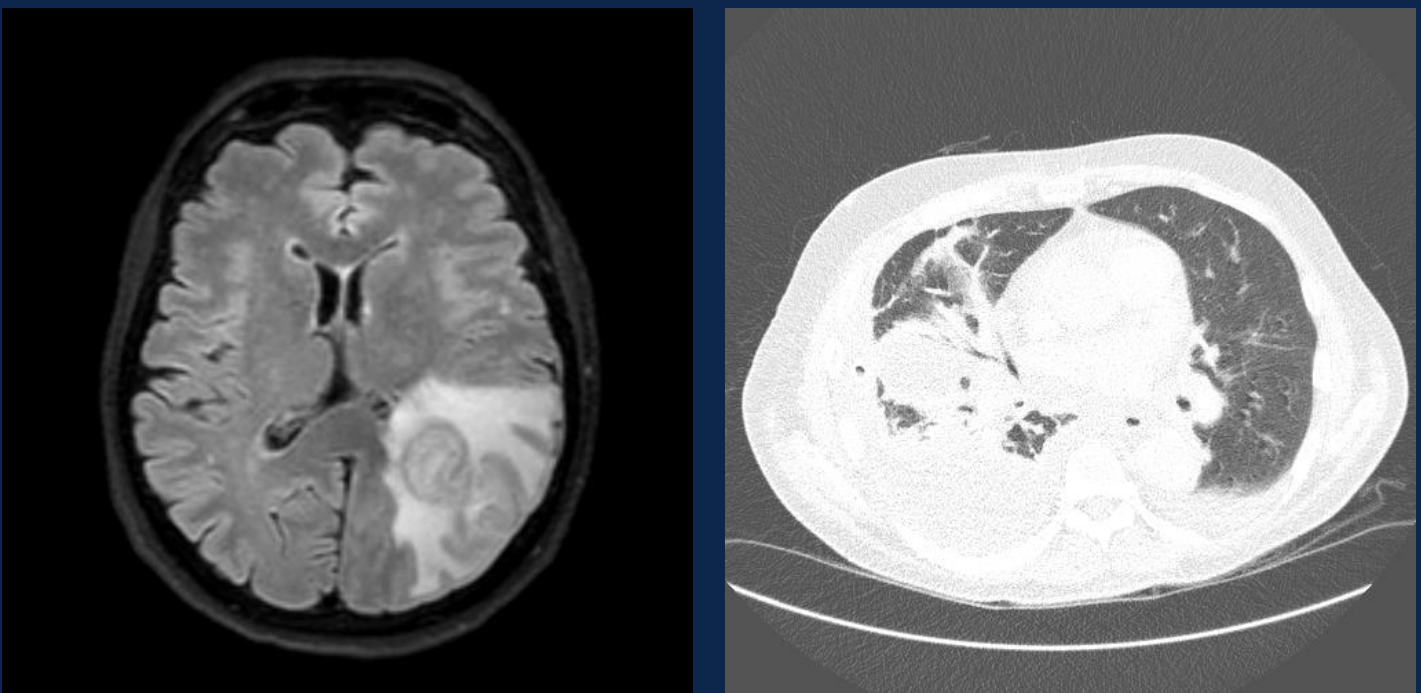
We describe the demographic and the clinical characteristics of these patients and their management, outcome and the site of isolation of *P. micra*.

Results Ninety-two subjects (69.7%) were males with a median age of 60.5 years (95% CI: 19-90); 20 (15.1%) had >3 co-morbidities and 24 (18.2%) had cancer. *P. micra* was mainly isolated from blood (n=37, 28%), lung (empyema, n=29, 22%) and abdomen (peritonitis, n=26, 19.7%). Overall, the drainage of the primary infective focus was performed in 100 patients.

In association with drainages, almost all patients received an antibiotic treatment, mainly penicillin derivate (amoxicillin/clavulanic acid or piperacillin/tazobactam) or third generation cephalosporin (mainly ceftriaxone).

In our cohort, 7 patients (5.3%) died during hospitalization; *P. micra* was found in blood, abdomen (peritonitis with colorectal abscesses) and soft tissue (necrotizing fasciitis) in 2 patients respectively, and in lung (empyema) in 1 patient. Six of them (85.7%) were males and median age was 76,6 years; 5/7 (71.4%) had ≥ 3 co-morbidities and 3/7 (42.9%) had cancer.

Five out of seven underwent a drainage of the infective focus and all were treated with broad-spectrum antibiotics (4 with imipenem/cilastatin and 3 with piperacillin/tazobactam).



Parvimonas micra infection involved brain and lung

Conclusions To date, this is the largest series describing *P. micra* infections in hospitalized patients. In addition to antibiotic treatment, the drainage of infective focus seems fundamental for the optimal management of these infections. Though *P. micra* is an unusual cause of severe infections, its identification should be considered when prescribing targeted antibiotic treatment. Our case series confirm that lungs, intra-abdominal region, soft tissues, ENT, bone/joints and CNS can be all infectious sites of *P. micra* infections. Finally, in patients with polymicrobial infections the results of anaerobic cultures should be taken into consideration to avoid inappropriate antibiotic selection. This case series can contribute to a better knowledge and management of infections caused by *P. micra* that are rarely reported in the current literature. Fatal outcome can be observed, particularly in elderly individuals with several co-morbidities.

Table 1. Clinical and demographical characteristics of the 132 patients with *Parvimonas micra* isolation.

CV: cardiovascular; COPD: chronic obstructive pulmonary disease. Other diseases include autoimmune, gastrointestinal or haematological diseases. ENT: ear, nose and throat; CNS: central nervous system. Lung infections include pleural empyema and lung abscesses; bone and joint infections include osteomyelitis, septic arthritis and spondylodiscitis; ENT infections include neck and oral abscesses.

	Total isolations N=132	Polymicrobial isolations N=101	Monomicrobial isolations N=31
Age (y), median (95% IQR)	60.5 (19-90)	59.5 (15-87)	64 (29-90)
Males, n (%)	92 (69.7)	68 (67.3)	24 (77.4)
No comorbidity, n (%)	56 (42.4)	42 (41.6)	14 (45.2)
≥ 3 comorbidities, n (%)	20 (15.1)	17 (16.8)	3 (9.7)
• CV diseases	37 (28)	27 (26.7)	10 (32.3)
• Diabetes	25 (18.9)	21 (20.8)	4 (12.9)
• Cancer	24 (18.2)	18 (17.8)	6 (19.3)
• Neurological diseases	16 (12.1)	13 (12.9)	3 (9.7)
• COPD	10 (7.6)	10 (9.9)	0
• Liver diseases	10 (7.6)	8 (7.9)	2 (6.5)
• Renal failure	7 (5.3)	5 (4.9)	2 (6.5)
• Other diseases	6 (4.5)	5 (4.9)	1 (3.2)
Source of isolation			
• Blood	37 (28)	24 (23.8)	13 (41.9)
• Lung	29 (22)	17 (16.8)	12 (38.7)
• Abdominal	26 (19.7)	26 (25.7)	0
• Soft tissue	23 (17.4)	23 (22.8)	0
• Bone and joint	8 (6.1)	6 (5.9)	2 (6.5)
• ENT	6 (4.5)	3 (3)	3 (9.7)
• Brain abscess	3 (2.3)	2 (2)	1 (3.2)
Surgical therapy, n (%)	100 (75.8)	76 (75.2)	24 (77.4)
Empiric antibiotic treatment			
• Penicillins	71 (53.8)	56 (55.4)	15 (48.4)
• Carbapenems	13 (9.8)	8 (7.9)	5 (16.1)
• Cephalosporin	12 (9.1)	10 (9.9)	2 (6.5)
• Vancomycin	4 (3)	2 (2)	2 (6.5)
• Combination treatment	32 (24.2)	25 (24.7)	7 (22.6)
Targeted antibiotic treatment			
• Penicillins	10 (7.6)	6 (5.9)	4 (12.9)
• Carbapenems	10 (7.6)	7 (6.9)	3 (9.7)
• Clindamycin	6 (4.5)	4 (4)	2 (6.5)
• Cephalosporin	17 (12.9)	13 (12.9)	4 (12.9)
• Combination treatment			
30-days mortality, n (%)	7 (5.3)	6 (5.9)	1 (3.2)