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Emergence of a Microbe in a New Geographic Area

Pneumonia due to *Ochrobactrum intermedium* in an ICU patient

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ABSTRACT

Ochrobactrum intermedium is recognized as a rare emerging opportunistic pathogen mostly related with bloodstream infections. In this report, we describe the first clinical case of pneumonia due to *O. intermedium.* The case involved a 71-year old tetraplegic man hospitalized for vertebral fractures after falling from a ladder.

A 71-year old male patient was transported to the emergency department of AHEPA University Hospital, Thessaloniki with tetraplegia after accidental fall. An emergency MRI of the cervical spine revealed spinal cord contusion at the level of C5/C6 intervertebral space. The patient was transferred to the operating room for surgical treatment. Postoperatively, transdermal tracheostomy was performed and the patient subsequently continued treatment in the neurosurgery clinic.

Nine days later, the patient experienced cardiac arrest, from which he achieved spontaneous circulation after cardiopulmonary resuscitation and was admitted to the ICU. Upon admission, the patient initially remained under sedation and was placed on mechanical ventilation. Extensive consolidations with air bronchograms in the lower lobes were observed from the chest CT scan and X-ray performed before admission to the ICU. On the first day of admission, the patient exhibited signs of infection with a white blood cell count (WBC) of 18,000/mm^3, C-reactive protein (CRP) of 11 mg/L (normal range 0–0.8 mg/dl), and procalcitonin (PCT) of 1.35 ng/ml (normal range <0.5 ng/ml), while remaining hypothermic. Bronchial secretion cultures before ICU admission were positive for extensively drug-resistant *Acinetobacter baumannii*, leading to the initiation of treatment with colistin. The patient gradually recovered from respiratory infection which was evidenced by the reduction of inflammatory markers (WBC: 12,000/mm^3, CRP: 4 mg/L, and PCT: 0.05 ng/ml) and improvement in radiography findings.

On the ninth day of hospitalization in the ICU, the patient developed fever up to 38.5 °C. Bronchial secretion cultures were obtained and a chest X-ray revealed consolidation in the left lower lobe of the lung. Laboratory tests on the 11th day of hospitalization showed WBC: 17,000/mm^3, CRP: 8 mg/L and PCT: 0.1528 ng/ml. The bronchial secretion culture was negative for *A. baumannii* but positive for a different microorganism. The isolate was identified as *Ochrobactrum intermedium* by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS; Bruker Microflex, Biotyper 3.1; Bruker Daltonics, Bremen, Germany). The antimicrobial susceptibility testing was performed by VITEK2 (bioMérieux, France) and interpreted using the EUCAST breakpoints v 13.1 for *Pseudomonas* spp. (Table 1). Other causes of infection were ruled out and eventually the treatment was reinforced with meropenem based on the latest laboratory findings. On the 16th day of hospitalization in the ICU the patient was successfully transferred to a high-dependency unit (HDU).

Ochrobactrum spp. are phenotypically and genetically related closely to *Brucella* spp [1]. They are non-lactose-fermenting, Gram-negative environmental rods with low virulence that may act as opportunistic pathogens [2]. Reports of infections caused by *O. intermedium* are rare and commonly related to bacteremias in immunocompromised patients [3–5] whereas *Ochrobactrum anthropi* is more frequently encountered as an infectious agent [6]. Notably, *O. intermedium* is intrinsically resistant to penicillins, cefalosporins and colistin; therefore the use of colistin in our case for the treatment of *Acinetobacter* spp. may have played a role in the development of this infection. To the best of our knowledge, this is the first clinical case report of pneumonia due to *O. intermedium* and thus hopefully might contribute to the awareness of its virulent potential especially among patients receiving colistin.

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Table 1
Antimicrobial testing results of the *Ochrobactrum intermedium* isolate. MIC: minimum inhibitory concentration, S: susceptible; R: resistant; I: susceptible increased exposure.

Antimicrobial	MIC	Interpretation
Ampicillin/sulbactam	≥32	R
Piperacillin/sulbactam	≥128	R
Ceftriaxone	≥64	R
Ceftazidime	≥64	R
Cefepime	32	R
Aztreonam	≥64	R
Imipenem	1	S
Meropenem	1	S
Ciprofloxacin	0.5	I
Levofloxacin	0.5	I
Amikacin	32	R
Gentamycin	8	R
Colistin	≥16	R
Fosfomycin	≥256	R

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Georgios Meletis: Writing – original draft, Investigation, Data curation, Conceptualization. **Pinelopi Amoiridou:** Writing – original draft, Investigation. **Paraskevi Mantzana:** Writing – review & editing, Validation, Investigation. **Ioanna Soultati:** Validation, Investigation. **Efthymia Protonotariou:** Writing – review & editing, Validation, Supervision. **Lemonia Skoura:** Validation, Supervision.

Declaration of competing interest

All authors report no conflicts of interest relevant to this article.

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