

First report of pneumonia and septic shock caused by *Cedecea lapagei* in Vietnam

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Abstract

Cedecea lapagei is rarely known to cause infections in humans. We report the first case of pneumonia and septic shock caused by *Cedecea lapagei* in a 38-year-old man in Vietnam. *Cedecea lapagei* may be an emerging infectious agent in humans.

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Keywords: *Cedecea lapagei*, Emerging pathogen, Pneumonia, Septic shock, Vietnam

Original Submission: 13 March 2020; **Revised Submission:** 23 April 2020; **Accepted:** 13 May 2020

Article published online: 23 May 2020

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Case report

A 38-year-old man with a history of type 2 diabetes mellitus was admitted to 108 Military Central Hospital in Vietnam with a 2-day history of fatigue, cough, sputum, myalgia, fever and shortness of breath.

On admission, vital signs revealed a temperature of 39.5°C, heart rate 110 beats/minute, blood pressure 60/40 mmHg, respiratory rate 28 breaths/minute and oxygen saturation 94% with 15 L O₂/minute via a mask with oxygen reservoir bag.

On physical examination, he was somnolent and disorientated to place, time and situation. His skin was pale. The lungs showed bibasilar rales. Another systemic examination was normal.

The laboratory test revealed a white blood cell count of $17 \times 10^6/L$ with neutrophils of 91%, procalcitonin of 1.83 ng/mL, glucose of 52 mmol/L. Arterial blood gas showed a pH of 7.42, PaCO₂ of 20 mmHg, PaO₂ of 68 mmHg, HCO₃⁻ of 13 mmol/L and lactate of 3.1 mmol/L. The other laboratory tests were unremarkable.

Chest radiography and CT scan revealed the bilateral lower lobe infiltration and consolidations. Two sets of blood cultures of samples and sputum culture were taken into blood agar and MacConkey agar after 24 hours of incubation at 35°C with 5% CO₂.

Broad-spectrum antibiotic therapy was initiated with meropenem 3 g/day and ciprofloxacin 800 mg/day empirically combined with intravenously administered fluid therapy, noradrenaline and insulin.

The result of blood cultures was negative, but sputum cultures were positive for *Cedecea lapagei*. Species identification was performed using Vitek MS (bioMérieux, Marcy l'Étoile, France). The antibiotic was kept the same for 8 days, according to antimicrobial susceptibility (Table 1).

On hospital day 8, he had no fever. Sputum culture was negative. Antibiotic was stopped, and he was discharged.

Discussion

Cedecea is a genus of extremely rare bacteria of the family *Enterobacteriaceae*. Five species have been identified, including *Cedecea davisae*, *Cedecea lapagei* and *Cedecea neteri* and two unnamed species [1,2]. *Cedecea lapagei* was recognized as a human pathogen in 2006 [3].

After searching the PubMed database limited to human studies, a total of 11 cases have been identified, including four

TABLE 1. Antimicrobial susceptibilities of *Cedecea lapagei* isolate obtained from 38-year-old man

Antibiotic	MIC (µg/mL)	Interpretation
Piperacillin	16	Intermittent
Piperacillin/tazobactam	≤4	Sensitive
Ceftazidime	≤1	Sensitive
Ceftriaxone	≤1	Sensitive
Cefazolin	≤4	Sensitive
Cefoxitin	≤4	Sensitive
Aztreonam	≤1	Sensitive
Imipenem	≤0.25	Sensitive
Meropenem	≤0.25	Sensitive
Amikacin	≤2	Sensitive
Gentamicin	≤1	Sensitive
Tobramycin	≤1	Sensitive
Levofloxacin	1	Sensitive
Ciprofloxacin	1	Sensitive
Trimethoprim/sulfamethoxazole	≥320	Resistant

cases of pneumonia. Our patient is the fifth case of *C. lapagei* pneumonia and the first case in Vietnam.

The first report of *C. lapagei* pneumonia in a 34-year-old individual was successfully treated with tigecycline and vancomycin [4]. The second case was a 76-year-old man with acute respiratory failure in Korea and was treated with cefpodoxime [5]. Two cases of sepsis with *C. lapagei* nosocomial pneumonia in infants have also been reported [6,7].

Cedecea lapagei was sensitive to ampicillin/sulbactam, tigecycline, gentamicin and tobramycin, and was resistant to multiple antibiotics, including amikacin, aztreonam, cefazolin, cefepime, ceftriaxone, ciprofloxacin, ertapenem, imipenem, meropenem, moxifloxacin, nitrofurantoin and colistin [4,7].

This is the first case report of pneumonia due to *C. lapagei* in an immunocompromised individual with diabetes mellitus in Vietnam. However, a significant limitation in our report is the lack of pathogen identification by 16S

rRNA gene sequencing because this technique is not available in our hospital.

In conclusion, *C. lapagei* may be a newly emerging pathogen of pneumonia in humans.

Conflict of interest

The authors declare that there is no conflict of interest and we did not receive any funding for this work.

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