human illness, such as bacteremia, endocarditis and osteomyelitis (1). *N. elongata* comprises 3 subspecies: subsp. *elongata*, *glycolytica* and *nitroreducens*. Herein, we present a rare case of continuous ambulatory peritoneal dialysis (CAPD) peritonitis caused by *N. elongata* subsp. *nitroreducens*.

A 60-year-old male patient had been on CAPD for 18 months. The underlying cause of his renal failure was probably hypertensive renal disease. He was admitted to the hospital with complaints of abdominal pain and turbid dialysate but no fever for 4 days. On admission, his abdomen was soft with mild tenderness. The tunnel and exit site of the Tenckhoff catheter were found to have no signs of infection. The initial laboratory values were as follows: serum albumin 28 g/L, urea 21.4 mmol/L, creatinine 1220 μ mol/L, serum potassium 2.5 mmol/L, white blood cell count 4.4×10^9 /L, neutrophils 68.9%, C-reactive protein 26 mg/L, hemoglobin 117 g/L. The peritoneal fluid white cell count was $6,364 \times 10^6$ /L, with polymorphonuclear cell count of 81%. The patient was treated empirically with intraperitoneal cefazolin and amikacin with an unsatisfactory response. The dialysate culture report suggested *N. elongata* subsp. *nitroreducens* and the blood culture results were negative. The organism was identified based on standard biochemical reactions (oxidase positive, urease negative, lysine and ornithine negative, indole negative, acid from glucose negative, phenylalanine positive, catalase negative, nitrate reduction positive, nitrite reduction positive) and with a *Neisseria*-*Haemophilus* card on Vitek2 compact system (bioMérieux, Marcy l'Etoile, France). In view of this, the regime was switched to intraperitoneal gentamicin and ceftriaxone. The patient also received parenteral nutrition because of his poor nutritional status. The patient showed clinical response after the switch of antibiotics, with a rapid drop in peritoneal fluid cell count to normal range within 3 days. The treatment continued for 2 weeks, and his peritonitis resolved with negative culture of the peritoneal fluid. The patient was discharged without relapse of peritonitis upon follow-up for 8 months.

N. elongata subsp. *nitroreducens*, formerly known as CDC (Centers for Disease Control and Prevention) group M-6, is a gram-negative, oxidase-positive, aerobic, non-motile, rod-shaped organism, which was identified in 1990 as a third subspecies of *N. elongata* (2). *N. elongata* subsp. *nitroreducens* isolates obtained from humans were predominantly from the respiratory tract (mostly throat and sputum), blood, and wounds. It has been increasingly recognized to be a rare but important cause of human endocarditis, where risk factors involved could be dental procedures and valvular heart disease (3–4). Other reported cases included brain abscess, bacteremia

Peritoneal Dialysis-Related Peritonitis Caused by *Neisseria Elongata* Subsp. *Nitroreducens*, The First Report

Editor:

Among *Neisseria* species, *N. elongata* is an important opportunistic pathogen which has been associated with

and osteomyelitis (1,5). To the best of our knowledge, no case of CAPD-related peritonitis due to *N. elongata* has been reported. In the present patient, poor nutrition and chronic kidney disease could be the predisposing factors for developing *N. elongata* peritonitis. The source of the peritonitis was possibly contamination from mouth organisms because *N. elongata* subsp. *nitroreducens* is present in oropharyngeal flora, and no symptoms of exit-site infection or septicemia have been presented. *N. elongata* endocarditis can be treated with penicillin G, ampicillin or ceftriaxone, often in combination with gentamicin, whereas surgical intervention was required in 57% of cases (6). The strain in our case was susceptible to gentamicin and ceftriaxone, which is consistent with previous reports of infective endocarditis (7–8).

In conclusion, *N. elongata* subsp. *nitroreducens* is a rare cause of PD-related peritonitis. Our experience suggests that *N. elongata* subsp. *nitroreducens* peritonitis can be successfully treated with appropriate antibiotics, without removal of the Tenckhoff catheter.

DISCLOSURES

The authors have no conflicts of interest to declare.

M. Lin
G. K. Yang
M. Z. Gao
F. Y. Hong*

Division of Nephrology,
Fujian Provincial Hospital, Fujian Medical University,
Fuzhou, China

*email: mlinys@hotmail.com

REFERENCES

1. Wong JD, Janda JM. Association of an important *Neisseria* species, *Neisseria elongata* subsp. *nitroreducens*, with bacteremia, endocarditis, and osteomyelitis. *J Clin Microbiol* 1992; 30(3):719–20.
2. Grant PE, Brenner DJ, Steigerwalt AG, Hollis DG, Weaver RE. *Neisseria elongata* subsp. *nitroreducens* subsp. nov., formerly CDC group M-6, a gram-negative bacterium associated with endocarditis. *J Clin Microbiol* 1990; 28(12):2591–6.
3. Struillou L, Raffi F, Barrier JH. Endocarditis caused by *Neisseria elongata* subspecies *nitroreducens*: case report and literature review. *Eur J Clin Microbiol Infect Dis* 1993; 12(8):625–7.
4. Hoshino T, Ohkusu K, Sudo F, Nakajima H, Ishiwada N, Ezaki T, et al. *Neisseria elongata* subsp. *nitroreducens*

endocarditis in a seven-year-old boy. *Pediatr Infect Dis J* 2005; 24(4):391–2.

5. Hofstad T, Hope O, Falsen E. Septicaemia with *Neisseria elongata* ssp. *nitroreducens* in a patient with hypertrophic obstructive cardiomyopathy. *Scand J Infect Dis* 1998; 30(2):200–1.
6. Haddow LJ, Mulgrew C, Ansari A, Miell J, Jackson G, Malnick H, et al. *Neisseria elongata* endocarditis: case report and literature review. *Clin Microbiol Infect* 2003; 9(5):426–30.
7. Kociuba K, Munro R, Daley D. M-6 endocarditis: report of an Australian case. *Pathology* 1993; 25(3):310–2.
8. Dominguez EA, Smith TL. Endocarditis due to *Neisseria elongata* subspecies *nitroreducens*: case report and review. *Clin Infect Dis* 1998; 26(6):1471–3.

doi: 10.3747/pdi.2013.00114