

## Peritonitis Due to *Pseudomonas stutzeri*, an Organism That May Be Difficult to Culture

### Editor:

Peritonitis is a complication that can be caused by well-known pathogens such as *Staphylococcus epidermidis* and less frequently occurring gram-negative microorganisms. However some microbial agents that cause continuous ambulatory peritoneal dialysis (CAPD)-related peritonitis cannot be detected using standard culture techniques. For this reason further culturing methods such as the VITEK 2 biochemical identification system (bioMérieux, Marcy l'Etoile, France) are required for the identification of some pathogenic agents (1,2). We present here the first case of CAPD-related peritonitis caused by *Pseudomonas stutzeri* that was not grown by standard culturing methods.

A 54-year-old female patient had been receiving CAPD therapy for approximately 2.5 years because of renal amyloidosis complicated by end-stage renal disease. Her medical history included two episodes of peritonitis: one due to coagulase-negative *Staphylococcus epidermidis* and the other due to coagulase-negative *Staphylococcus haemolyticus*. On admission, the patient presented with diffuse abdominal pain and cloudy dialysate for 2 days. No findings of infection were observed at the CAPD catheter exit site or tunnel. Typical peritonitis findings were found on physical examination and others were normal. Peritoneal fluid examination revealed peritonitis with leukocyte count of 1000/mm<sup>3</sup> (100% neutrophils).

Gram-stain of the dialysate revealed gram-positive bacilli and standard culture technique was performed. After 72 hours of appropriate empirical antibiotic [intra-peritoneal (IP) cefazolin] treatment, peritoneal fluid culture identified methicillin-resistant coagulase-negative staphylococcus. The antibiotic treatment was changed to IP vancomycin but no improvements in clinical or peritoneal fluid findings (dialysate leukocyte count 2960/mm<sup>3</sup>) were seen. In addition, Gram stain of the peritoneal fluid revealed gram-negative bacilli. Identification of the micro-organism was done using VITEK 2 and *Pseudomonas stutzeri* was detected. Ciprofloxacin was added to the treatment according to the antibiogram. No response was observed on the fifth day of both

vancomycin and ciprofloxacin therapies (2840 leukocytes/mm<sup>3</sup>) and there was no clinical improvement. For this reason, the Tenckhoff catheter was removed and renal replacement treatment was switched to hemodialysis. Culture of the IP portion of the catheter was negative. The patient's clinical and laboratory findings were better at the first week's evaluation following catheter removal. The treatment of both vancomycin and ciprofloxacin was applied for 21 days. There was no peritonitis episode during the 4-month follow-up period.

*Pseudomonas stutzeri* is an aerobic, nonfermenting, active, gram-negative oxidase-positive bacteria. It is mostly a saprophyte found in soil, water, and hospital environments and rarely leads to serious community-acquired infection (3,4). Infections due to *P. stutzeri* have been observed infrequently. In humans, *P. stutzeri* is generally considered a contaminant and it becomes an opportunistic pathogen when the host's defense mechanisms are weakened. However, it causes bacteremia and local infections, including meningitis, endocarditis, conjunctivitis, arthritis, brain abscess, pneumonia, sepsis, and bacteremia (3–10). According to our knowledge, no CAPD-related peritonitis caused by these bacteria has been reported.

Despite antibiotic treatment of patients on CAPD, causes of persistently positive dialysate cultures include tunnel infection, intra-abdominal abscess, unusual micro-organisms, and slime layer colonization of the intra-abdominal portion of the catheter. In our patient, no finding of infection was observed in the exit site or the tunnel of the peritoneal catheter and ultrasonography of the patient's abdomen was negative for abscess. Since no micro-organisms grew in the removed catheter, the probable cause in our patient was not colonization of the catheter itself. Unusual organisms should be considered if dialysate cell count and peritonitis symptoms fail to improve within 3 days. Therefore, identification should be performed using such methods as the VITEK system. It is easy to use, can provide early results and antibiotic sensitivity tests, and is not expensive. In the VITEK system, >90% of identifications of gram-positive cocci and gram-negative rods are obtained within 7 hours of incubation, and it correctly detects 97.7% of antimicrobial resistance (11). Using this system, Sunbul *et al.* identified *P. stutzeri* in a case of meningitis (4).

This is the first reported case of CAPD-associated peritonitis caused by *Pseudomonas stutzeri*. It can be treated with intravenous antibiotics and removal of the peritoneal dialysis catheter. Moreover, if there is no response to the susceptible antibacterial drugs of choice for the treatment of peritonitis within 3 days, further culture techniques, especially VITEK, should be performed.

## DISCLOSURES

The authors do not have any conflict of interests to declare and there are no financial conflicts of interest.

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