## *Actinomyces neuii* PD Peritonitis—Resolution of Infection Without Catheter Removal

*Editor:*

We report a case of a patient with peritoneal dialysis (PD) peritonitis caused by *Actinomyces neuii* subspecies *neuii* treated successfully without need for catheter removal.

The patient is an 87-year-old woman with type II diabetes mellitus, coronary artery disease, and peripheral vascular disease from a long-term health care facility on continuous cycling PD (CCPD). She developed abdominal pain and cloudy fluid. The PD fluid leukocyte count on the day of onset of symptoms was 449/mm$^3$ with 89% neutrophils. While awaiting the PD fluid cultures, she was started on empiric intermittent intra-peritoneal (IP) cefazolin and ceftazidime as per International Society for Peritoneal Dialysis (ISPD) guidelines (1) along with oral nystatin as anti-fungal prophylaxis. The clinical and laboratory response was immediate with normalization of the fluid leukocyte count in 1 day. She was continued on the same IP antibiotics.

Fourteen days after diagnosis, the initial PD fluid grew *Actinomyces neuii* subspecies *neuii*. The *Actinomyces* was identified on routine culture. It did not grow on direct plating to agar but grew in the BacT/Alert FN anaerobic bottle, which, when subcultured, grew on both the sheep blood agar and chocolate agar subcultures. The PD fluid count was normal at this point and thereafter and cultures also remained sterile. On the recommendation of the infectious disease service, the IP antibiotic was changed to Penicillin G 50,000 U per liter of PD fluid loading dose, and 25,000 U per liter for a subsequent 4 weeks. She did not require catheter removal as there was no recurrence of PD peritonitis at any time in the course of her treatment.

The etiology of culture-negative PD peritonitis is presumed to be gram-positive microbes such as coagulase-negative staphylococci (1) and if the peritonitis improves, ISPD guidelines recommend continuation of initial empiric therapy for 2 weeks. However, it may be prudent to consider unusual organisms as being causative as in this case. This becomes relevant especially in the event of relapse or recurrence of PD peritonitis.

Peritoneal dialysis peritonitis due to *Actinomyces* is extremely rare and has been reported 3 times previously (2–4), requiring catheter removal in the first 2 cases (2,3). *Actinomyces* peritonitis has also been reported in 2 patients on hemodialysis, having been on PD at an earlier time (5,6). One of these patients presented with large bowel perforation due to actinomycosis of the sigmoid colon (6). *Actinomyces* has been reported to cause PD exit-site infections (7).

*Actinomyces neuii* (formerly "CDC coryneform group 1" bacteria) (8) is unique among all species of *Actinomyces* in that it rarely shows classic sulfur granules and gram-positive filaments on microscopy, appearing instead as coccoid or diphtheroidal without branching (9).

Infection may present in a myriad of ways such as abscesses, infected atheromas, infected cutaneous ulcers, endophthalmitis, endocarditis, and even bacteremia. Rarer presentations include chorioamnionitis, pericarditis, osteomyelitis, prosthetic joint infection, ventriculo-peritoneal shunt infection, urinary tract infection, and prostatitis. *Actinomyces neuii* PD peritonitis has only been reported once previously and, owing to rapid resolution of infection, did not require catheter removal (4). There is no known age or gender predilection or increased presentation among the immunocompromised. Antibiotic susceptibility of *A. neuii* is similar to other *Actinomyces* i.e. beta-lactam antibiotics, carbapenem, vancomycin, macrolides, clindamycin, and rifampin. The appropriate duration of therapy has not been determined and possibly needs to be tailored based on the site of infection. Peritoneal dialysis peritonitis probably necessitates between 2 and 6 weeks and needs negative cultures to ensure eradication. Catheter removal may be needed in polymicrobial infection and where there is inadequate clinical response (4).

Prompt and early initiation of IP cefazolin as part of empiric treatment probably led to easy resolution of *neuii* PD peritonitis in our patient and successful treatment without the need of catheter removal.

## DISCLOSURES

The authors have no financial conflicts of interest to declare.

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