Enterococcus avium Peritonitis in a Child on Continuous Ambulatory Peritoneal Dialysis

A 10-year-old girl with end-stage renal disease because of neurogenic bladder who had been on continuous ambulatory peritoneal dialysis (CAPD) for 2 years was admitted to the emergency department in January 2012 because of fever, cloudy effluent, abdominal pain, nausea, and vomiting. She was born with myelomeningocele and had been treated with a ventriculoperitoneal shunt for existing hydrocephalus.

Physical examination was normal, except for the presence of fever (38.6°C) and abdominal tenderness. Her catheter exit site had no inflammatory signs. Gram stain of peritoneal fluid was significant for the presence of many polymorphonuclear leukocytes and the absence of bacteria.

After a diagnosis of spontaneous bacterial peritonitis was made, intraperitoneal amikacin treatment (12 mg/L, after a loading dose of 25 mg/L) was promptly initiated. Upon receiving culture results that reported the growth of *Enterococcus avium* from effluent samples, intraperitoneal vancomycin treatment (15 mg/kg 1×1 every 5 days, after a loading dose of 1 g/L) was added to the regimen. The tip of the peritoneal catheter sent for culture also had grown *E. avium*.

The patient responded to the 14-day treatment and recovered from the peritonitis completely, but 5 days after completion of antibiotic treatment, she developed clinical manifestations of raised intracranial pressure, suggesting a shunt obstruction. Computed tomography imaging of the brain confirmed enlargement of the brain ventricles and blockage of the peritoneal end of the shunt. The ventriculoperitoneal shunt was replaced by external ventricular drainage. The patient was switched to maintenance hemodialysis.

Unfortunately, 13 days after recovery from her peritonitis, the patient died from an intracranial hemorrhage that was a result of hypertension (140/110 mmHg) after a hemodialysis session. The use of heparin as an anticoagulant during hemodialysis might have been a predisposing factor.

DISCUSSION

Peritoneal fluid samples were inoculated into aerobic and anaerobic blood culture vials (Bactec 9050: Becton–Dickinson, Mountain View, CA, USA) and incubated in an automated blood culture system. Upon detection of growth signals, samples from each bottle were subcultured and incubated aerobically at 35°C. Small, smooth grayish-white colonies with alpha hemolysis grew on the 5% sheep-blood agar. The gram-positive, catalase- and coagulase-negative organism hydrolyzed bile esculin and grew in 6.5% sodium chloride. It was identified as *E. avium* by the Vitek 2 automated system (bioMérieux, Marcy l'Etoile, France).

E. avium, formerly known as group D *Streptococcus,* is a gram-positive, catalase-negative coccus-shaped organism that hydrolyzes bile esculin and grows in 6.5% sodium chloride. It possesses group D antigen. It is normally found in the urogenital and intestinal tracts of human beings and animals (1). Being regarded as a pathogen of low virulence, the very rare infections caused by *E. avium* are seen mostly in patients with underlying immunosuppressive conditions and are usually of a polymicrobial character because of the typically intra-abdominal source (2).

This first case of CAPD-related peritonitis caused by *E. avium* is unusual in the type of organism isolated and in its pure growth, rather than being part of a polymicrobial infection. The *E. avium* might have originated from urogenital and intestinal tract colonization, and the transmission route might be related to direct contamination of connection devices or to bacterial translocation through colonized body sites.

E. avium should be considered a rare causative agent for spontaneous peritonitis in CAPD patients so that an appropriate choice of treatment can be made.

DISCLOSURES

The authors declare that no financial conflict of interest exists.

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REFERENCES

1. Winn WC, Allen SD, Janda WM, Koneman EW, Procop GW, Schreckenberger PC, *et al.* Gram-positive cocci. In: Koneman EW. *Koneman's Color Atlas and Textbook of Diagnostic Microbiology.* 6th ed. Philadelphia, PA: JB Lippincott; 2006: 701–4.
2. Na S, Park HJ, Park KH, Cho OH, Chong YP, Kim SH, *et al.* *Enterococcus avium* bacteremia: a 12-year clinical experience with 53 patients. *Eur J Clin Microbiol Infect Dis* 2012; 31:303–10.

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