CASE REPORT

Brevibacterium casei isolated as a cause of relapsing peritonitis

Mohammed Mahdi Althaf,¹ Mohamed Said Abdelsalam,^{1,2}
 Mohammed Sunaid Alsunaid,¹ Maged Hassan Hussein¹

¹Department of Medicine, Section of Nephrology, King Faisal Specialist Hospital and Research Center, Riyadh, Ar-Riyadh, Saudi Arabia

²Faculty of Medicine, Internal Medicine Department, Alexandria University, Alexandria, Egypt

Correspondence to

Dr Mohammed Mahdi Althaf, moalthaf@kfshrc.edu.sa, malthaf@outlook.com

Accepted 18 February 2014

SUMMARY

We report a case of relapsing peritonitis in a 33-year-old woman on automated peritoneal dialysis. End-stage renal disease was secondary to systemic lupus erythematosus complicated with lupus nephritis. The organism isolated was *Brevibacterium casei* that was not readily identified, delaying appropriate management with an extended antibiotic course. Definite management of *B casei* peritonitis was peritoneal dialysis catheter removal.

BACKGROUND

Peritonitis remains as a frequent and potentially severe complication of peritoneal dialysis (PD); appropriate and timely management is crucial. Failing to do so may result in treatment failure necessitating change to other modes of renal replacement therapy.¹ The most common pathogens are Staphylococci and Enterobacteriaceae but other organisms are involved as well.² Occasionally, in clinical practice, we encounter unusual organisms that cause peritonitis. These organisms may need specific laboratory investigations to identify them early on to help clinicians decide the best course of treatment. As in the case we present here, identification was not simple, requiring the peritoneal dialysate effluent to be analysed with mass spectrometry. Awaiting the results, we treated the patient empirically based on Gram-stain, which resulted in a good clinical response. However, on completion of the antibiotic course, she had relapses. Once the organism was identified as *Brevibacterium casei*, we reviewed the literature as we were dealing with an unusual organism. Although sensitive to vancomycin, this organism was recognised as a cause of relapsing peritonitis in one of the case reports. Thus, the PD catheter had to be removed in our patient for definite eradication. Had we identified the organism earlier, we would have opted for earlier removal of the PD catheter and the patient would have had a shorter duration of vancomycin exposure and its possible side effects.

CASE PRESENTATION

A 33-year-old woman known to have systemic lupus erythematosus complicated with lupus nephritis leading to end-stage renal disease in 2008 was initially on continuous ambulatory peritoneal dialysis and later switched to automated peritoneal dialysis in 2009. She had one episode of culture-negative peritonitis in August 2012. She presented

with severe abdominal pain and fever. On physical examination, the patient was in moderate distress with diffuse abdominal tenderness; there was no evidence of exit site or tunnel infection. The patient denied any recent ingestion of raw milk.

INVESTIGATIONS

PD effluent was cloudy with a white cell count (WCC) of 8350/μL, confirming peritonitis. As per International Society of Peritoneal Dialysis (ISPD) guidelines,³ empiric antibiotic treatment was administered in the form of ceftazidime and cefazolin intraperitoneally. The patient had an excellent response to treatment with effluent WCC down to 7/μL within 48 h. Initial cultures revealed Gram-positive rods but the organism was not identified, and the sensitivity patterns were pending. Based on the clinical response, she was discharged in 4 days to continue both antibiotics at home for a period of 14 days. A surveillance culture carried out on day 8 of therapy revealed persistent Gram-positive rods but the effluent WCC was 2/μL and the patient was asymptomatic, so we continued the same plan of management. Since the organism was still not identified by our microbiologists, the sample was sent to the Mayo Clinic Laboratory (Rochester, Minnesota, USA) for identification. Two days after completing the antibiotic course, the patient presented with symptoms and signs of peritonitis with a similar magnitude to the previous attack, again with no evidence of exit site or tunnel infection. The effluent WCC count was 2980/μL.

TREATMENT

Since the organism was identified as a Gram-positive rod, we initiated intravenous vancomycin, targeting a serum trough level of 15 mg/L.

OUTCOME AND FOLLOW-UP

After 2 weeks of treatment, PD effluent WCC went down to 28/μL, and 4 days on cessation of vancomycin, she presented for the third time with fever and abdominal pain, PD effluent WCC was 3000/μL and culture remained positive for Gram-positive rods. By this time the organism was identified as 2.273 *B casei*. They employed mass spectrometry using the microflex LT MALDI-TOF MS instrument with flexControl and MALDI Biotyper software (Bruker Daltonics, Billerica, Massachusetts, USA) for the identification. As this was an unusual organism, we reviewed the literature and found a case report suggesting that this organism was a cause of relapsing peritonitis and that the best

CrossMark

To cite: Althaf MM, Abdelsalam MS, Alsunaid M S, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-203611

management would be PD catheter removal due to possible catheter colonisation of the organism. Therefore, the PD catheter was removed and she was switched to haemodialysis and treated for another 2 weeks with vancomycin. Catheter tip-culture failed to grow *B casei*.

DISCUSSION

B casei has been previously identified and reported as a cause of relapsing peritonitis in a patient on PD; in this report, the utility of 16S rRNA gene sequencing for accurate species identification was also highlighted.⁴ *B casei* are catalase-positive, non-

spore-forming, immotile, aerobic Gram-positive rods found in raw milk and surface-ripened cheese as well as on human skin and in certain animal sources.⁵ They are known to cause an array of infections in humans, ranging from peritonitis, meningitis, cholangitis and salpingitis to sepsis. Most isolates were derived from blood cultures.⁶ In our patient, definitive eradication of the organism was only possible after PD catheter removal. This case highlights the importance of early and appropriate identification of pathogens causing peritonitis in patients on PD, thereby directing appropriate clinical management based on organism susceptibility and characteristics.

Contributors All authors contributed equally to the management of the patient and preparation of this case report.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

Learning points

- ▶ Occasionally, we encounter atypical organisms that cause peritonitis in patients on peritoneal dialysis. Early and appropriate identification is crucial for accurate clinical management.
- ▶ Certain organisms such as *Brevibacterium casei* require specific laboratory investigations such as mass spectrometry or 16S rRNA gene sequencing for accurate species identification.
- ▶ Failure to identify the organism may lead to an extended clinical course of peritonitis, which may lead to peritoneal membrane failure requiring change of renal replacement modality and/or sepsis. In addition, patients may be unnecessarily exposed to longer durations of antibiotics.

REFERENCES

- 1 Davenport A. Peritonitis remains the major clinical complication of peritoneal dialysis: the London, UK, peritonitis audit 2002–2003. *Perit Dial Int* 2009;29:297–302.
- 2 Kim DK, Yoo TH, Ryu DR, *et al*. Changes in causative organisms and their antimicrobial susceptibilities in CAPD peritonitis: a single center's experience over one decade. *Perit Dial Int* 2004;24:424–32.
- 3 Li PK, Szeto CC, Piraino B, *et al*. Peritoneal dialysis-related infections recommendations: 2010 update. *Perit Dial Int* 2010;30:393–423.
- 4 Poesen K, Meeus G, Boudewijns M, *et al*. Relapsing *Brevibacterium casei* peritonitis: value of 16S rRNA gene sequencing in accurate species identification. *Perit Dial Int* 2012;32:341–4.
- 5 Murray PR, Baron EJ, Jorgensen JH, Landry ML, Pfaller MA, eds. *Manual of Clinical Microbiology*. 9th ed. Washington, DC: ASM Press; 2007.
- 6 Funke G, Carlotti A. Differentiation of *Brevibacterium* spp. encountered in clinical specimens. *J Clin Microbiol* 1994;32:1729–32.

Copyright 2014 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow