

Atypical Peritonitis Agents and Clinical Follow-Up in Peritoneal Dialysis Patients: Case Report

Periton Diyaliz Hastalarında Atipik Peritonit Etkenleri ve Klinik İzlemleri

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ABSTRACT Peritoneal dialysis (PD) is an effective renal replacement strategy for patients suffering from end-stage renal disease. Peritonitis is one of the most common and most challenging problems of this patient group. Peritonitis attacks may result in peritoneal membrane failure and may force switching to hemodialysis but also may even cause death. Gram positive organisms are the most common organisms but uncommon organisms may also lead to peritonitis episodes. With proper empirical antibiotic regimens peritonitis can be treated successfully. Recently peritonitis cases due to rare organisms have been increasing. In order to prevent relapsing and recurrent peritonitis attacks, rare organisms that lead to peritonitis should be identified and managed. Herein we aimed to report 3 cases due to some of these rare peritonitis agents.

Key Words: Peritoneal dialysis; peritonitis; kidney failure, chronic

ÖZET Periton diyalizi (PD) son dönem böbrek hastalığına sahip olan hastalar için etkin bir renal replasman tedavisi yöntemidir. Bu hasta grubunun en sık karşılaşılan ve en zorlayıcı sorunlarından biri peritonittir. Peritonit atakları periton membran yetersizliğine neden olabilir, hemodiyalize geçilmesini zorunlu hale getirebilir ve aynı zamanda ölümlerle bile sonuçlanabilir. Gram pozitif organizmalar en sık karşılaşılan organizmalardır fakat nadir organizmalar da peritonit ataklarına yol açabilirler. Uygun antibiyotik rejimleriyle peritonit başarı ile tedavi edilebilmektedir. Son zamanlarda nadir organizmaların oluşturduğu peritonit vakaları artmaya başlamıştır. Nüksedici ve yinelenen peritonit ataklarını önleyebilmek için peritonite neden olabilen nadir organizmalar tanınmalı ve tedavi edilmelidir. Burada nadir peritonit etkenlerinden bazılarının neden olduğu 3 vakayı bildirmeyi amaçladık.

Anahtar Kelimeler: Periton diyalizi; peritonit; böbrek yetmezliği, kronik

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Peritonitis is a common complication of peritoneal dialysis. When peritoneal fluid culture is obtained by proper culture technique, it is very likely to diagnose the culprit microbial agent. Gram positive organisms are the most common organisms whereas anaerobic, enteric organisms or multiple enteric organisms suggest secondary peritonitis. Sometimes uncommon organisms can be seen as peritonitis agents. We had 3 uncommon organisms that growth in the peritoneal cultures of peritonitis patients recently. Samples of dialysis fluid were aspirated by our specialist continuous ambulatory peritoneal dialysis (CAPD) nurse by an aseptic technique and sent to our microbiological laboratory in 30 minutes. Leu-

cocyte count were performed by nageotte bright-line hemacytometer and Gram and Giemsa stain were performed on the dialysate samples of all cases. Approximately 5 cc dialysate was inoculated in a BACTEC BacT/ALERT (BIOMERIEUX, INC. Durham) and 5% sheep blood and Eosin-Methylene blue agar. After 24 hours of inoculation cultures were controlled. Identifications were determined using the Vitek2 system (bioMeriux SA, France).

CASE 1

A 47 years old male who is working as a bus driver was on CAPD for 2 months as a consequence of chronic kidney disease due to nephrolithiasis. He presented with complaints of nausea and vomiting. He had diarrhea for 3 days and he recognised that his dialysis solution was cloudy for 2 days. His peritoneal dialysis solution culture was obtained and cell count was made. There were 12.000 leucocytes/mm³, 90 percent as polymorphonuclear leucocytes and in the culture there was Gram positive coccus: *Staphylococcus caprae*. He was treated with cephazoline for 14 days. The following cultures were negative and there were no cloudier peritoneal dialysis solutions.

CASE 2

A 48 years old female was on CAPD for 6 years due to chronic kidney disease. The etiology for chronic kidney disease was chronic pyelonephritis. She presented with complaints of abdominal pain and cloudy fluid from the peritoneal catheter. The organism that growth from the peritoneal fluid was *Bacillus subtilis*. She was treated empirically with cephazoline and seftazidime for 4 days but no laboratory and clinical response could be achieved. *Bacillus subtilis* was accepted as the culprit organism of the peritonitis and treatment was changed to clindamycin. Peritonitis was treated successfully with clindamycin monotherapy.

CASE 3

A 43 years old female was on CAPD as a result of chronic kidney disease due to hypertension for 2

years. She presented with continuous abdominal pain increasing during filling peritoneal dialysis solution. She was started with cephazoline and ceftazidime therapy empirically. The peritoneal fluid culture result was *Pantoea* spp. Ceftazidime anti-biotherapy continued for 14 days and clinical and laboratory responses were achieved.

DISCUSSION

Peritonitis is a serious problem for the peritoneal dialysis population and it is the leading cause of technique failure causing significant morbidity and mortality. Early diagnosis and treatment are essential. A variety of microorganisms were identified in these cases. Coagulase-negative *Staphylococcus* spp. are the most common isolate.¹ We present 3 uncommon organisms that were isolated as culprit peritonitis agents.

In our first patient we isolated *Staphylococcus caprae* from the peritoneal fluid. As a coagulase negative *Staphylococcus* spp, *S. caprae* has not been reported as a clinically-significant member. It was first isolated in goat milk sample taken from healthy goats in 1983.² This bacterium has been associated with bone and joint infections, bacteremia, recurring sepsis, urinary infections, endocarditis and meningitis.³⁻⁶ Our patient reported he was a goat shepherd 30 years ago. Slime production and biofilm formation are traits of *S. caprae* and they may play a role in conferring virulence to this species. We successfully treated this patient with cephazoline.

In our second patient we isolated *Bacillus subtilis* from the peritoneal fluid. *B. subtilis* is a Gram-positive aerobic, spore-forming soil bacterium ubiquitous in the environment. The pathogenic potential of *B. subtilis* is generally absent. In the literature only a few cases of infections due to *B. subtilis* were reported.^{7,8} We first used cephazoline and ceftazidime for 4 days in our patient but we could not have a significant response to this anti-biotherapy. Peritoneal cell count did not decrease. *Bacillus subtilis* was accepted as the culprit agent because peritoneal cell count decreased within 7 days of clindamycin therapy.

We isolated *Pantoea* spp in our third patient as the responsible agent from peritonitis. *Pantoea* spp is a ubiquitous Gram-negative bacterium that can be found in plants, fruits, vegetables and the feces of humans and animals. *Pantoea* spp has been implicated as the causative agent of a wide spectrum of infectious diseases, ranging from wound infection, cellulitis, to bacteremia.^{9,10} In the literature there are a few cases about peritonitis caused by *Pantoea* spp.¹¹⁻¹³ Lim et al. cured a CAPD patient with *Pantoea* peritonitis with ceftazidime and intraperitoneal amikasin successfully and catheter was saved.¹¹ In another patient. *Pantoea agglomerans* was treated with intraperitoneal sefuroxim and ciprofloxacin but because of clinical and laboratory unresponsiveness imipenem was started on third day. Despite offering removal of catheter, this was refused and the patient had died due to septic shock.¹² In another peritoneal dialysis patient, peritonitis due to *Pantoea* was cured by cefotaxime and intraperitoneal gentamisin but catheter was replaced by a new one.¹³ In our patient we treated *Pantoea* peritonitis with 14 days of ceftazidime antibiotherapy successfully and peritoneal catheter was saved from being replaced. Oral contamination or bacterial translocation from gastrointestinal system may be responsible for *pantoea* infections. Peritoneal catheters are not known to be a risk fac-

tor of infection by *Pantoea* spp. We believe that bacterial translocation may be responsible factor for the peritonitis episode but as she was a farmer a plant associated injury might be responsible from this peritonitis episode.

In conclusion, these organisms are commonly considered to be contaminants, they rarely can cause symptomatic infections. These three organisms were probably the true culprit agents despite they are not common peritonitis agents. Physicians must be careful about these uncommon pathogens within peritoneal dialysis patients.

DISCLOSURES

No author involved in the preparation of the present manuscript has a conflict of interest in any form.

Informed consent: ‘Informed consent was obtained from all individual participants included in the study.’

Ethical approval: ‘All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.’

REFERENCES

1. Prasad KN, Singh K, Rizwan A, Mishra P, Tiwari D, Prasad N, et al. Microbiology and outcomes of peritonitis in northern India. *Perit Dial Int* 2014;34(2):188-94.
2. Moroni P, Pisoni G, Antonini M, Ruffo G, Carli S, Varisco G, et al. Subclinical mastitis and antimicrobial susceptibility of *Staphylococcus caprae* and *Staphylococcus epidermidis* isolated from two Italian goat herds. *J Dairy Sci* 2005;88(5):1694-704.
3. Ross TL, Fuss EP, Harrington SM, Cai M, Perl TM, Merz WG. Methicillin-resistant *Staphylococcus caprae* in a neonatal intensive care unit. *J Clin Microbiol* 2005;43(1):363-7.
4. Shuttleworth R, Behme RJ, McNabb A, Colby WD. Human isolates of *Staphylococcus caprae*: association with bone and joint infection. *J Clin Microbiol* 1997;35(10):2537-41.
5. Blanc V, Picaud J, Legros E, Bes M, Etienne J, Moatti D, et al. [Infection after total hip replacement by *Staphylococcus caprae*. Case and review of the literature]. *Pathol Biol (Paris)* 1999;47(5):409-13.
6. Benedetti P, Pellizzer G, Furlan F, Nicolin R, Rasso M, Setton A. *Staphylococcus caprae* meningitis following intraspinal device infection. *J Med Microbiol* 2008;57(Pt 7):904-6.
7. Kiss T, Gratwohl A, Frei R, Osterwalder B, Tichelli A, Speck B. [Bacillus subtilis infections]. *Schweiz Rundsch Med Prax* 1988; 77(45):1219-23.
8. Richard V, Van der Auwera P, Snoeck R, Daneau D, Meunier F. Nosocomial bacteremia caused by *Bacillus* species. *Eur J Clin Microbiol Infect Dis* 1988;7(6):783-5.
9. Flatauer FE, Khan MA. Septic arthritis caused by *Enterobacter agglomerans*. *Arch Intern Med* 1978;138(5):788.
10. Kratz A, Greenberg D, Barki Y, Cohen E, Lifshitz M. *Pantoea agglomerans* as a cause of septic arthritis after palm tree thorn injury; case report and literature review. *Arch Dis Child* 2003;88(6):542-4.
11. Lim PS, Chen SL, Tsai CY, Pai MA. *Pantoea* peritonitis in a patient receiving chronic ambulatory peritoneal dialysis. *Nephrology (Carlton)* 2006;11(2):97-9.
12. Kahveci A, Ascioglu E, Tigen E, Ari E, Arıkan H, Odabasi Z, et al. Unusual causes of peritonitis in a peritoneal dialysis patient: *Alcaligenes faecalis* and *Pantoea agglomerans*. *Ann Clin Microbiol Antimicrob* 2011; 10:12.
13. Lau KK, Ault BH, Jones DP. Polymicrobial peritonitis including *Pantoea agglomerans* from teething on a catheter. *South Med J* 2005;98(5):580-1.