

Received: 2012.08.11
Accepted: 2012.12.12
Published: 2012.12.17

Authors' Contribution:

- A** Study Design
- B** Data Collection
- C** Statistical Analysis
- D** Data Interpretation
- E** Manuscript Preparation
- F** Literature Search
- G** Funds Collection

Double zoonotic peritonitis

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Background:

Peritonitis continues to be a major problem for peritoneal dialysis patients. The incidence of peritonitis has decreased in recent decades but uncommon organisms are increasingly being reported.

Case Report:

We report an 83 year old man with history of diabetes mellitus, arterial hypertension, coronary artery disease and end stage renal disease on peritoneal dialysis, who developed recurrent peritonitis due to simultaneous presence of two uncommon organisms, *Pasturella multocida* and *Capnocytophaga*. The patient was treated with antibiotics but he did not respond well and therefore his peritoneal dialysis catheter was removed. We discuss the microbiology of both organisms and review the literature.

Conclusions:

Peritonitis is a major problem for peritoneal dialysis patients and although improved technology has decreased the incidence of peritonitis, unusual organisms are increasingly reported. Pet owners who are on peritoneal dialysis, should be aware of the risks of association with animals

key words:

peritonitis • pasturella • Capnocytophaga

Summary

Full-text PDF:

<http://www.amjcaserep.com/fulltxt.php?ICID=883659>

Word count:

1056

Tables:

–

Figures:

–

References:

14

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BACKGROUND

Peritonitis remains a major complication of peritoneal dialysis and the main impediment to its widespread use and a frequent cause of switch to hemodialysis. With implementation of better infection control procedures and new connectology techniques, incidence of peritonitis with common organisms has decreased significantly in the past two decades, but unusual organisms are increasingly being observed and reported. We recently encountered a case of peritonitis caused by two zoonotic organisms. To our knowledge this is the first such case ever reported.

CASE REPORT

The patient was an 83 year old man with history of arterial hypertension, coronary artery disease and end stage renal disease, on peritoneal dialysis for two years. He was admitted to the hospital through the emergency room because of abdominal pain. Peritoneal dialysis fluid cell count showed, white blood cell count (WBC) of 437000 per cmm, with >90% neutrophils. He was diagnosed to have peritonitis and he was treated empirically with intermittent intraperitoneal (IP) administration of vancomycin and ceftazidime. Peritoneal fluid culture grew *Pasturella multocida* and antibiotic therapy was changed to oral ciprofloxacin, to which the organism was sensitive. PD fluid cell count continued to decrease and repeat cultures were negative. However, the cell count remained between 100 to 120, with neutrophil count of 20 to 30%. Treatment with ciprofloxacin was continued for three weeks, with the patient feeling better and clinically free from infection. Concluding that peritonitis had been adequately treated, ciprofloxacin was stopped and surveillance continued. One week later, he developed recurrent abdominal pain and PD fluid cell count increased to 1025 cells/cmm, with 78% neutrophils. He was re-treated initially with IP vancomycin and ceftazidime. Fluid culture came back positive for *Capnocytophaga*, but due to evanescence of the organism, it could not be further subtyped. Based on antibiotic sensitivity pattern provided by the microbiology laboratory, he was treated with intraperitoneal Unasyn that was continued for two weeks. While on Unasyn, PD fluid cell count decreased and peritoneal fluid culture was repeatedly negative, but it continued to show a 30 to 40% neutrophil count. Due to refractoriness of peritonitis, the peritoneal dialysis catheter was removed and he was switched to hemodialysis.

DISCUSSION

Our patient had two unusual organisms causing peritonitis: *Pasturella Multocida* and *Capnocytophaga*, both zoonotic organisms. *Pasturella Multocida* species have been isolated from various animals and can be present either as a saprophyte in the nasopharynx or gastrointestinal tract or as a primary pathogen [1]. Humans are usually infected as a result of an animal contact [2,3]. It is a gram negative organism and it has three subspecies: *Multocida*, *septica* and *gallicida*. *Pasturella multocida*, subsp. *multocida* is usually acquired as a result of dog or cat or hamster bites and scratches. *P. multocida*, subsp. *septica* is more common with cat related injuries and it may have more affinity for the central nervous system. *P. Multocida* subsp. *multocida* and subsp. *septica* can be differentiated by fermentation of sorbitol and dulcitol. Further

analysis can be done by using a PCR finger printing technique [4]. Many cases of *P. Multocida* peritonitis in peritoneal dialysis patients have been reported.

Capnocytophaga is a slow gram negative rod, with tapered ends and gliding mobility that has several subtypes, *Canimorsus*, *cynodegmi*, *ochracea*, *gingivalis*, *granulosa*, *hemolytica*, *leadbetteri* and *sputigena*. *Capnocytophagas* are fastidious, filamentous, capnophilic organisms, meaning they need extra carbon dioxide for their growth. They are part of the normal flora of dogs and cats, canines, rabbits and human beings. They are of low virulence for healthy human beings but they can cause severe infections in immunocompromised hosts including, cellulitis, sepsis, thrombotic thrombocytopenic purpura [6], infectious purpura fulminans [7] osteomyelitis, abscesses, meningitis [8], endocarditis, keratitis, chorioamnionitis and neonatal infection. Patients with history of alcoholism, splenectomy, asplenia, pregnancy and young children, are at high risk for serious complications after exposure to *C. canimorsus*. Cases of corneal infection and endophthalmitis with *C. cynodegmi* have been reported after corneal transplantation. The disease is usually transmitted to humans via a dog bite or sometimes cat scratches. In a study from the Netherlands, 21% of cats and 19% of dogs had *C. canimorsus* and *C. cynodegmi* in their mouths [9] but a similar study from Japan reported even a higher incidence of 74 and 52% respectively for dogs and cats [10].

Peritonitis is not a common complication of *capnocytophaga* infections. Pers et al. [11] reported the case of 67 year old man who was on automated peritoneal dialysis and developed *C. cynodegmi* peritonitis. Peritonitis did not respond to antibiotic therapy and peritoneal dialysis catheter was removed [11]. Chadha et al. [12] reported a case of *C. canimorsus* peritonitis in an 18 year old man on APD and Esteban et al. reported [13] another case in a patient on CAPD.

It is difficult to distinguish *C. cynodegmi* from *C. Canimorsus*, but for clinical purposes, identification of the genus is enough for diagnosis and treatment. However, *C. cynodegmi* can be differentiated from *C. canimorsus*, by being sucrose, raffinose, melibiose and inulin positive and may reduce nitrate to nitrite.

Due to fastidious nature of the organism, it is difficult to obtain susceptibility testing for antimicrobials but the organism has been reported to be sensitive to penicillin, ampicillin, piperacillin, amoxicillin, ofloxacin, cefotaxime, ceftazidime, imipenem, erythromycin and clindamycin [11,14]. In our patient due to difficulty in growing the organism, no susceptibility testing was done and due to this, he was empirically treated initially with vancomycin and ceftazidime and later with intraperitoneal unasyn (ampicillin/sulbactam). In spite of 3 weeks of treatment, he failed to clear the organisms and due to this the peritoneal dialysis catheter was removed.

CONCLUSIONS

We have reported a case of simultaneous *Pasturella multocida* and *capnocytophaga* peritonitis that was difficult to treat and required removal of the peritoneal dialysis catheter and transfer to hemodialysis. Our patient admitted to having cats that occasionally entered his room and he

played with them. Due to this, peritoneal dialysis bags and lines that he had used were inspected and no puncture site was found in either one of them. The patient thought hand contamination with cat saliva may have been the source of his infection. Peritoneal dialysis patients who are cat and dog owners, need to be reminded of the high incidence of *Pasturella* and *Capnocytophaga* carrier rates in these animals and they should be advised not to allow these animals to come in contact with them and their dialysis supplies.

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