

ЗАМІТКИ ІЗ ПРАКТИКИ

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Aeromonas Sobria: a Rare Cause of Continuous Ambulatory Peritoneal Dialysis-Related Peritonitis

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Abstract. Peritonitis is a very common complication in patients treated with continuous ambulatory peritoneal dialysis. The most common causes are gram positive cocci (part of the normal skin flora), and then gram negative bacteria, while fungi are listed as a rare cause of peritonitis. *Aeromonas species* are identified as a rare cause of continuous ambulatory peritoneal dialysis-related peritonitis. Among them, *Aeromonas hydrophila* is somewhat more common, followed by *Aeromonas caviae*.

Case presentation. We reported a case of continuous ambulatory peritoneal dialysis peritonitis caused by *Aeromonas sobria* that is extremely rare cause of this type of peritonitis. In our patient, pseudomembranous colitis occurred as a complication and, reinfection – another episode of peritonitis with *Klebsiella pneumoniae*. Treatment with third-episode cephalosporins was successful and patient continued treatment with continuous ambulatory peritoneal dialysis.

Conclusions. The rare causes of peritonitis should not be ignored, especially those which lead to increased morbidity and mortality of patients.

Keywords: *Aeromonas sobria*; peritoneal dialysis; peritonitis

Problem statement and analysis of the recent research

Species of *Aeromonas* are Gram-negative, non-spore-forming, rod-shaped, facultatively anaerobic bacteria that occur ubiquitously and autochthonously in aquatic environments [1]. *Aeromonads* are present in water, fresh vegetables, fish, meat, domestic animals and in the hospital water supply system [2]. These germs can be found in large numbers in nutrient-rich water as well as in a range of temperatures from 0°C to 42°C reaching a peak in the warmest summer months [3]. The genus currently includes 14 validated phenotypic species; however, only 7 of them have been associated with human disease; *Aeromonas hydrophila*, *Aeromonas veronii biovar sobria*, and *Aeromonas caviae* are the most common causative species [3].

These germs can cause a wide variety of infections in human, from primary bacteremia, gastrointestinal and biliary tract infections to soft tissue infections. *Aeromonas* bacteremia usually occurs in patients with underlying illnesses, although it may occur in immunocompetent patients as well [4].

In patients treated with continuous ambulatory peritoneal dialysis (CAPD), peritonitis is not rare complication. The most common causes are gram positive cocci (part of the normal skin flora), and then gram negative bacteria, while fungi are listed as a rare cause of peritonitis. *Aeromonas species* are identified as a rare cause of CAPD-related peritonitis. Among them, *Aeromonas hydrophila* is somewhat more common, followed by *Aeromonas caviae*.

We reported a case of CAPD peritonitis caused by *Aeromonas sobria* that is extremely rare cause of this type of peritonitis.

Case presentation

A 44-year old man with end-stage renal failure on CAPD presented with abdominal pain and nausea. He had diarrhoea a few days ago, and afterwards had no stool for two days. While he was undergoing CAPD, he noticed that the effluent was cloudy and yellowish.

Eleven years ago, he had bilateral nephrectomy; however he did not know the underlying disease. Afterwards, he was treated with haemodialysis for two years and, then, cadaveric renal

transplantation was performed. Transplanted kidney functioned for seven years, and due to renal graft failure he started haemodialysis again. In five months, patient was switched to peritoneal dialysis.

Clinical exam revealed pallor skin and diffuse systolic murmur. Blood pressure at the admission was 115/80 mm Hg, whereas during hospital stay patient was hypertensive.

Laboratory findings showed anemia (hemoglobin - 93 g/L), erythrocyte sedimentation rate was 102 mm for the first hour and urea and creatinine were quite high (urea - 24.6 mmol/L, creatinine - 931 µmol/L). The low levels of majority serum electrolytes were observed (calcium - 1.98 mmol/L, magnesium - 0.82 mmol/L, chloride - 93 mmol/L, sodium - 129.7 mmol/L). The serum levels of potassium stayed in reference range (4.0 mmol/L), while the serum level of phosphate was even slight higher than normal range (1.74 mmol/L) as well as the level of parathyroid hormone (94 pg/mL).

Immediately after admission, we have started a standard treatment protocol with intraperitoneal application of first-generation cephalosporin (cefazolin) at a dose of 1 g in the first bag, and then 250 mg four times a day. Afterwards, the clinical and laboratory improvement occurred. *Aeromonas sobria* was isolated from peritoneal effluent culture, sensitive to nearly all tested antibiotics (except for imipenem). The number of cells in sediment of the peritoneal effluent was around 300. Cultures from nasal smear, hand smear and catheter exit site smear were all sterile.

During hospital treatment, another complication occurred - pseudomembranous colitis (*Clostridium difficile* toxin A and B in stool were confirmed). Stool test did not reveal the presence of *Salmonella*, *Shigella* and *Yersinia enterocolitica* bacteria. Therefore, we have conducted the treatment with vancomycin, metronidazole, mesalazine and probiotics per os. Nevertheless, another episode of peritonitis appeared. This time, *Klebsiella pneumoniae*, sensitive to all tested antibiotics (except for ampicillin) was isolated with the number of 27,800 leukocytes in sediment of the peritoneal effluent. We have continued the treatment of peritonitis with third-generation cephalosporin (ceftazidime) intraperitoneally (250 mg four times a day). Three weeks after treatment, the patient as well as laboratory findings improved, and treatment with CAPD was continued regularly with ultrafiltration of 1,900 ml. Written informed consent was obtained from the patient.

Discussion

Aeromonas species can cause a variety of infections in human population, from bacteremia to soft tissue infections. However, they are a rare cause of CAPD-related peritonitis and only a few cases have been reported. Immune compromised patients have a worse prognosis.

Wang et al. [5] published their five-year experience about *Aeromonas sobria* complex bacteremia, where they have concluded that this kind of bacteremia usually occurs in patients with liver cirrhosis or neoplasm and treatment with adequate antibiotics should be given early, especially in patients with

hypotension and impaired renal function.

Aeromonas sobria bacteremia is reported to have the highest mortality rate in this genus (*Aeromonas sobria* - 56%, *Aeromonas hydrophila* - 33%, *Aeromonas caviae* - 17%) [6]. In our patient, peritonitis caused by *Aeromonas sobria* was firstly complicated with pseudomembranous colitis and, then, with another episode of CAPD-related peritonitis (caused by *Klebsiella pneumoniae*). Nevertheless, the patient had recovered completely and continued his CAPD treatment regularly.

Munoz et al. [7] reported five cases of peritonitis caused by *Aeromonas species* and a review of 29 other cases; they have noticed that 71% of patients were males, just as it was in our case.

Jeon and Park [8] reported a case of automated peritoneal dialysis-related peritonitis caused by *Aeromonas caviae* that was not sensitive to ceftriaxone; therefore, it was necessary to replace the therapy with ciprofloxacin with no need for catheter removal. In our case, *Aeromonas sobria* peritonitis responded well to cephalosporins.

Aeromonas infection often occurs together with another disease, for instance malignancy, intestinal perforation or chronic liver disease [9]. In our patient, pseudomembranous colitis was present as well.

The outcome of peritoneal dialysis (PD)-related peritonitis caused by *Aeromonas species* is mostly good; however, sometimes recurrent peritonitis can occur. Similarly, during hospital stay, our patient got another episode of peritonitis – reinfection.

Conclusions

In conclusion, each PD center has to do a map of the most common causes of peritonitis, as well as their sensitivity to antibiotics. This is important due to the adaptation of therapeutic protocols for treatment of CAPD-related peritonitis for each center specifically. However, the rare causes of peritonitis should not be ignored, especially those which can lead to increased morbidity and mortality in a certain group of patients.

Informed Consent

Written informed consent was obtained from the patient who participated in this case.

Conflict of Interest

The authors stated no conflict of interest.

Financial Disclosure

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