中文題目：遲鈍艾德氏菌-罕見的腹膜透析腹膜炎之致病原

英文題目：*Edwardsiella tarda* as a rare pathogen of peritoneal dialysis-associated peritonitis

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Introduction:

Peritoneal dialysis (PD)-associated peritonitis is an important complication of PD, and may result in significant morbidities or even death. The leading pathogens of PD-associated peritonitis in Taiwan are Gram positive bacteria (1), but certain Gram negative bacteria can be identified in patients with PD-associated peritonitis. We here present a case with PD-associated peritonitis caused by *Edwardsiella tarda*, an unusual pathogen to human.

Case:

A 43 year-old housewife with end stage kidney disease due to chronic glomerulonephritis, and receiving continuous ambulatory peritoneal dialysis for 5 years visited our hospital because of cloudy peritoneal dialysate for 3 days.

Since five months before the episode of peritonitis, watery diarrhoea 4 to 6 times a day was noted. There was no fever, nausea, vomiting, abdominal pain, stool with mucus, blood ting, or odd smell. There was no other family member with similar symptoms. During the course, no antibiotic treatment was given.

Until one month before the episode of peritonitis, watery diarrhoea stopped spontaneously, but 3 weeks later, cloudy dialysate was noted.There was no abdominal pain nor diarrhea. Physical examination on day 0 revealed afebrile, soft abdomen with mild diffuse tenderness and rebounding pain. The exit site of the Tenckhoff catheter was clean and without redness, swelling or discharge. Ascites analysis showed cloudy yellowish fluid with leukocyte count of 3089 /uL, of which 77% was neutrophil. Peritonitis was thus diagnosed. Empirical antibiotics with daily cefazolin 1000 mg and gentamicin 40 mg intraperitoneally were then given. However, after an one-week course of antibiotic treatment, cloudy dialysate was still noted. Ascites analysis on day 7 revealed white blood count of 150 /uL, of which 49% was neutrophil. Ascites culture yielded *Edwardsiella tarda*, which was susceptible to cefazolin, cefmetazole, cefotaxime, cefepime, ciprofloxacin, levofloxacin, ertapenem, imipenem, gentamicin and amikacin. Daily intraperitoneal cefepime 1000 mg was prescribed instead. Due to refractory peritonitis, the patient was finally admitted for removal of Tenckhoff catheter on day 13 of the course, and received insertion of Hickmann catheter on the next day. After the surgeries, the patient was transferred from peritoneal dialysis to hemodialysis 3 times

a week, and was discharged with a 14-day course of levofloxacin (500 mg QOD for 7 days, then 750 mg QOD for another 7 days). There was no further report of symptoms or signs of recurrent peritonitis.

Discussion:

Peritoneal dialysis (PD)-associated peritonitis is a common complication of peritoneal dialysis, and may contribute to more than 15% of death in patient on PD. (2) Moreover, it may also result in severe morbidities, including technique failure of peritoneal dialysis and switch to long-term hemodialysis. (1) Therefore, the prevention of PD-associated peritonitis and prescribing a suitable antibiotic treatment on time are crucial.

Edwardsiella tarda (*E. tarda*), named by Ewing who first reported the newly discovered species in 1965, was a member of the family Enterobacteriaceae. (3) The bacterium is a Gram negative, motile, facultative anaerobic rod, and shares similar biochemical characteristics with *E. coli* and *Salmonella*. (4) Isolated mainly from fresh water and marine environment, it was one of the important pathogens of aquatic animals, and may lead to multiple organ infections in fish. (5) Numerous documents report that *E. tarda* has a world-wide distribution (5), and is able to cause infection to fish, reptiles, birds and mammals. (5) However, it is an uncommon human pathogen. (4) *E. tarda* infection in human is more likely to occur in tropical and subtropical areas (6), including Taiwan, and the infection rate does not vary from season to season. (7)

Spread by direct contact or intake of improperly cooked aquatic animals, *E. tarda* infection in human mainly leads to gastroenteritis. (4, 8) However, according to previous reports, the bacterium still shows its ability to induce extra-intestinal diseases, including bacteremia, soft tissue infection, spontaneous bacterial peritonitis, biliary tract infection and intra-abdominal infection. (4) Major underlying diseases of patients with extra-intestinal infections of the species include hepato-biliary diseases, cancers, and diabetes. (4) When the pathogen spreads and causes extra-intestinal diseases, it may be potentially fatal. As reported, the mortality of *E. tarda* septicemia varies from 38% to 50%. (9) However, due to limited cases, there is no report of the mortality caused by *E. tarda*-related PD peritonitis. The only two reports available showed that *E. tarda*-related PD peritonitis has good outcome under proper antibiotic treatment. (4, 6)

E. tarda has been reported to be susceptible to a variety of antibiotics, including beta-lactam antibiotics, aminoglycosides, carbapenems and quinolones. Antibiotic treatment to the patients with *E. tarda* enteritis is not usually recommended, as the disease often resolves spontaneously. For extra-intestinal infections, combination therapy, including an aminoglycoside added on a

beta-lactam antibiotic, is often suggested. (10)

Previously, a case of PD-associated peritonitis causing by *E. tarda* was reported in Thailand in 2022 (6). The patient, a vegetarian, presented with turbid PD effluent and constant abdominal pain for 3 days, but without diarrhoea. Intraperitoneal cefazolin 1 g daily was prescribed for 21 days. Upon investigation, the patient might have been infected due to poor hand hygiene of the caregiver during exchange of PD bags. Unlike that patient, our patient is not a vegetarian, and as a housewife, she has to cook fish, shrimps and other aquatic animals. The possible source of *E. tarda* infection may be from intake of improperly cooked food, or from contamination of dialysate due to poor hand hygiene. Despite the use of intraperitoneal cefazolin and gentamicin, which the *E. tarda* isolated was susceptible to, our patient showed poor response to the proper antibiotic treatment. Therefore, our patient was suggested to receive removal of Tenckhoff catheter for refractory peritonitis. Since then, she has been switched from PD to hemodialysis.

Conclusion:

E. tarda is a potential pathogen to human, and is able to cause enteritis and extra-intestinal infections, including PD-associated peritonitis. Identifying the pathogen and a timely, appropriate treatment are essential to avoid severe morbidities and mortality.

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