Acute Cholecystitis, Sepsis, and Disseminated Intravascular Coagulation Caused by *Edwardsiella tarda* in an Elderly Woman

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Edwardsiella tarda **is a gram-negative bacillus associated with gastrointestinal diseases. It is rarely responsible for sepsis; however, the fatality is very high. Only two cases of *E. tarda* infections in patients over 90 years of age have been reported; these are not cases of sepsis associated with acute cholecystitis. We report a case of acute cholecystitis, sepsis, and disseminated intravascular coagulation (DIC) caused by *E. tarda* in a super-elderly woman aged over 90 years. There could be a possibility for recovery from sepsis and DIC if antimicrobial treatment responsiveness is ensured in the super-elderly.**

Key words: *Edwardsiella tarda*, sepsis, super-elderly, cholecystitis, DIC

INTRODUCTION

Edwardsiella tarda (*E. tarda*), an anaerobic Gram-negative bacterium, does not cause many infections. A common disorder caused by *E. tarda* is gastrointestinal disease, which resolves spontaneously. However, mortality rates are reportedly high in cases of sepsis [1–3]. In a literature review, only two cases of *E. tarda* sepsis were found in super-elderly people aged 90 years and older [2]. We report a case of acute cholecystitis, sepsis, and disseminated intravascular coagulation (DIC) caused by *E. tarda* in a super-elderly patient.

CASE REPORT

Case: 93-year-old woman

Chief complaint: Difficulty with mobility

Past history: Resection of left breast cancer, total hysterectomy for uterine fibroids, and shingles

Oral prescription: None

Life history: Solitude, independent activities of daily living.

Present illness: A progressive worsening left chest pain and difficulty with mobility reported on April 17, 20XX.

Medical examination: Consciousness level on Glasgow coma scale 14 points (E3V5M6), blood pressure 129/98 mmHg, pulse rate 165 bpm (regular), respiratory rate 30 breaths/min, and body temperature 39.9°C. A breast cancer surgical mark was observed on the left chest. The abdomen was slightly distended and soft, with no pain or tenderness, and no peritoneal irritation.

Laboratory findings at admission: Blood tests revealed an increased inflammatory response with white blood cells at 11700/μL, C-reactive protein level at 33.5 mg/dL, decreased platelet count (6.7×10^4/μL), increased lactate level (3.7 mg/dL), and abnormalities in the coagulation/fibrinolysis system (fibrin degradation product level 69.4 μg/mL, D-dimer level 31.2 μg/mL). Consolidation was not observed on a chest radiograph. Abdominal computed tomography revealed multiple gallbladder stones in the neck of the gallbladder and mild hyperplasia (Fig. 1), although no gallbladder tension was observed. The Quick Sequential Organ Failure Assessment score was 2 points, and the acute phase DIC score was 7 points.

Clinical course: Based on the findings, acute cholecystitis, sepsis, and DIC were diagnosed. Sulbactam/cefoperazone was initiated for sepsis associated with acute cholecystitis (Fig. 2A). On day 2, blood cultures revealed Gram-negative bacilli, and we switched to intravenous pazufloxacin. However, on the advice of the infection control team, on the same day, we changed the dosage to 3.375 g of tazobactam/piperacillin (TAZPIP) three times per day. The estimated creatinine clearance (CCr) at this time was 32.6 mL/min. On day 3, *E. tarda* was detected in blood cultures, and no drug resistance was observed. Heparin was administered at 15,000 U per day as no improvement in the DIC score was observed on the same day (Fig. 2B). TAZPIP was continued, amikacin (AMK) was initiated, and clindamycin (CLDM) was also used to prevent toxin production in necrotizing fasciitis. Thereafter, the general condition improved, the DIC score decreased in the blood test, and the inflammatory response also improved (Fig. 2B). No abnormalities were found in the skin during the course of the disease. Therapeutic drug monitoring of AMK did not meet the effective

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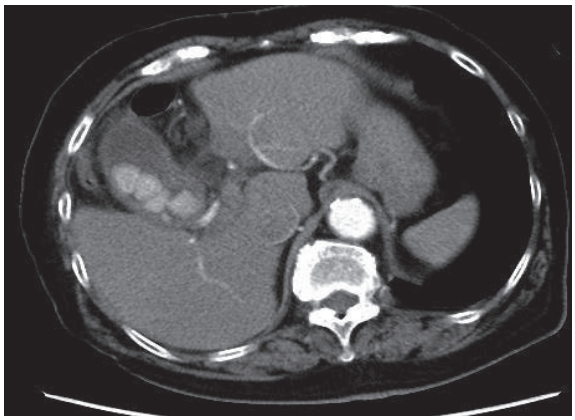

Fig. 1 Abdominal contrast computed tomography

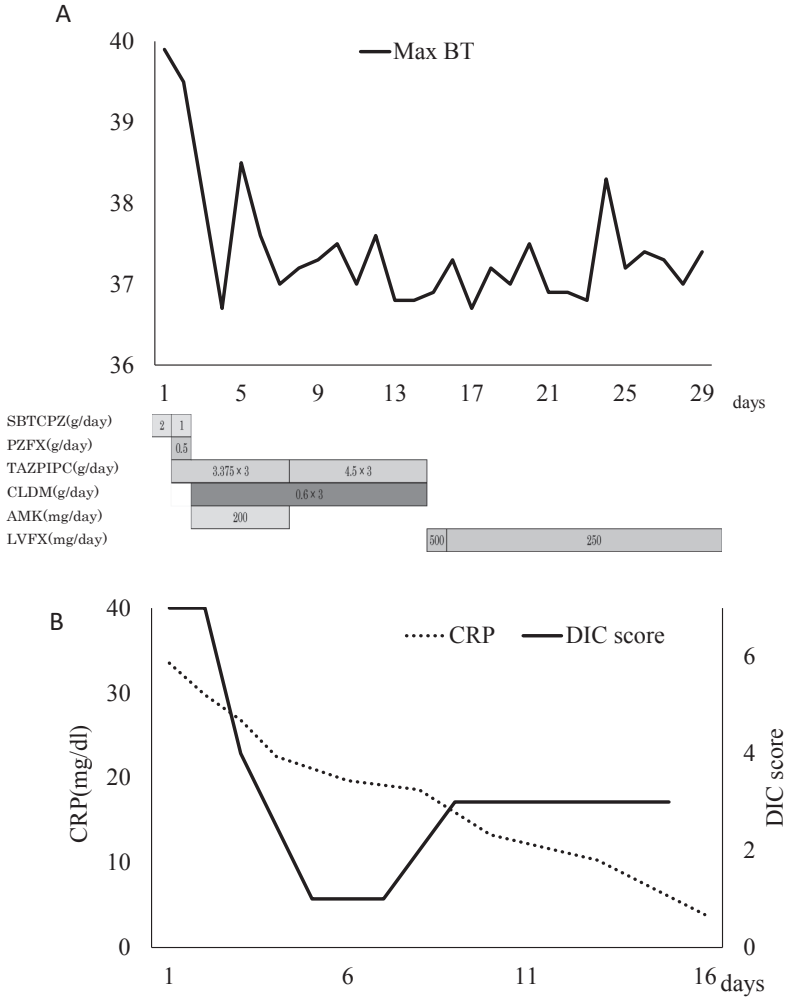

Fig. 2 Clinical course
A: Medication progress and body temperature
B: C-reactive protein and acute disseminated intravascular coagulation score

blood levels on day 8. AMK was discontinued to alleviate the symptoms. The renal function also improved (CCr 56.0 mL/min), and TAZPIP dosage was increased to 4.5 g three times per day. On day 16, we switched to oral levofloxacin. After an improvement in the inflammatory response, reduced dietary intake and physical difficulty associated with disuse syndrome were observed, and rehabilitation intervention was initiated. As the fever remained, antibiotic administration was continued until day 29, and the patient was discharged on day 35 to resume rehabilitation.

DISCUSSION

The main non-intestinal infections caused by *E. tarda* are hepatobiliary infections [1]. In general, it is rarely responsible for sepsis (0.02%) [2], although there are many reports of high mortality (12–61%) [2–8]. The average age of patients with sepsis caused by *E. tarda* is 61 years (ranging from 2 months to 101 years) [3]. As per our findings, only two cases (92 and 101 years) have been reported [2]. This is the third case of a super-elderly person aged 90 years or older and the

Table 1 Summary of the 39 cases of antibiotics for *Edwardsiella tarda* sepsis

Antimicrobial agents	Overall n (%)	Survived, n	Died, n
Beta-lactams	26 (66.7)	19	7
Beta-lactams + Quinolones	3 (7.7)	3	0
Beta-lactams + Lincomycins	3 (7.7)	2	1
Others	7 (17.9)	5	2
Total	39	29	10

first case of sepsis due to cholecystitis of them. The previously reported 92-year-old patient died of sepsis on day 32, and the 101-year-old patient recovered from cholangitis and sepsis after 10 days of treatment. In previous reports, many patients had a poor prognosis, especially necrotizing fasciitis [3], and attention should be paid to the progression from sepsis. Although there was no evidence of necrotizing fasciitis in this case, CLDM was administered for prophylactic purposes. Many patients with severe cases of *E. tarda* infection had underlying diseases [3]. In this case, a gallbladder stone was noted for the first time on admission, although no surgery was performed considering the patient's age. It has been reported that an age of 65 years and older is a risk factor (odds ratio 2.7) for *E. tarda* infection, and underlying diseases such as hepatobiliary disease are not necessarily risk factors [2]. The positive outcome was attributed to the favorable treatment response and absence of necrotizing fasciitis. *E. tarda* is generally sensitive to tetracyclines, β-lactams, aminoglycosides, and quinolones during treatment [9]. We searched PubMed and reviewed published English case reports of *E. tarda* sepsis in Japan since 2018 (Table 1) [10–18]. Although these antibiotics exhibit promising sensitivity, mortality rates are high for sepsis. In the present case, the response to antibiotic treatment was favorable, and clinical symptoms improved promptly.

In conclusion, we observed a case of acute cholecystitis, sepsis, and DIC caused by *E. tarda* in a super-elderly woman. There could be a possibility for recovery from sepsis and DIC if antimicrobial treatment responsiveness is ensured in the super-elderly population.

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