Journal of Research in
Orthopedic Science
August 2024. Volume 11. Number 3

Case Report

Edwardsiella tarda in a Young-aged Woman Without Underlying Diseases: A Case Report and Review of the Literature

Morteza Nakhaei Amroodi[1], Babak Roshanravan[1, 2], Mohammadreza Bahaeddini[1], Amir Sobhani[3], Mojtaba Baniasadi[1], Saeedreza Amiri[1*], Pouria Tabrizian[1*]

1. Bone and Joint Reconstruction Research Center, Department of Orthopedics, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.
2. Clinical Research Development Unit, Imam Reza Hospital, Birjand University of Medical Sciences, Birjand, Iran.
3. Department of Orthopaedic Surgery, Rasoul Akram Hospital, Iran University of Medical Sciences, Tehran, Iran.

Use your device to scan and read the article online

Citation Nakhaei Amroodi M, Roshanravan B, Bahaeddini M, Sobhani A, Baniasadi M, Amiri S, et al. *Edwardsiella tarda* in a Young-aged Woman Without Underlying Diseases: A Case Report and Review of the Literature. Journal of Research in Orthopedic Science. 2024; 11(3):173-176. http://dx.doi.org/10.32598/JROSJ.11.3.1801.3

http://dx.doi.org/10.32598/JROSJ.11.3.1801.3

Article info:
Received: 10 Mar 2024
Revised: 25 Apr 2024
Accepted: 23 Jub 2024
Available Online: 01 Aug 2024

Keywords:
Edwardsiella tarda, Case reports, Gram-negative bacteria, Infections, Immunocompromised host

ABSTRACT

Background: *Edwardsiella tarda* (a gram-negative bacterium) is an unusual human pathogen that is commonly isolated from aquatic animals like fish. Gastrointestinal symptoms are the most common manifestations of this bacterium; meanwhile, extraintestinal infections can also occur in humans, especially in people with immunodeficiency diseases.

Case Presentation: A 25-year-old Iranian woman who presented with a fracture of the greater tuberosity of the humerus underwent surgery with a deltopectoral approach with ETHIBOND EXCEL™ suture. She presented with pain, limited mobility, and fever 3 months after the surgery. A tissue culture sample was obtained, which was reported to be *E. tarda*. The patient showed uneventful recovery after antibiotic therapy with ciprofloxacin 500 mg, twice a day, as well as clindamycin 300 mg, thrice a day.

Conclusion: Although extraintestinal and systemic infections of *E. tarda* usually occur in patients with an underlying disease such as immunodeficiency or malignancy, we suggest that *E. tarda* infection might show extraintestinal manifestations even in patients without any known underlying diseases.

*** Corresponding Author:**
Saeedreza Amirim MD.
Address: *Bone and Joint Reconstruction Research Center, Department of Orthopedics, School of Medicine Iran University of Medical Sciences, Tehran, Iran.*
Phone: *+98 (912) 5388016*
E-mail: *amirisaeedreza@gmail.com*

Introduction

Edwardsiella tarda, a gram-negative bacillus, is a member of the Enterobacteriaceae family, which was first described by Bockemühl et al. [1]. This bacterium has been isolated from a wide range of animals in aquatic environments (including reptiles as well as saltwater and freshwater fishes), and rarely causes disease in humans. *E. tarda* causes mild digestive disease as well as gastroenteritis in most cases (80%) [2]. The remaining 20% of human *E. tarda* infections are extraintestinal diseases. Systemic and extraintestinal manifestations, including myonecrosis, meningitis, septic peritonitis, bacteremia, etc., have been reported in a few cases of patients (especially in patients with underlying disorders such as immunodeficiency disease, i.e. malignancy), which are potentially life-threatening conditions [2, 3]. Risk factors for *E. tarda* infections include exposure to aquatic animals, dietary habits (e.g. raw fish ingestion), pre-existing hepatobiliary diseases, hematological disorders, and malignancy [4].

Here, we report a rare case caused by *E. tarda* infection in a young patient with unknown previous underlying or immunodeficiency diseases.

Although systemic and extraintestinal *E. tarda* infections typically occur in patients with pre-existing risk factors and underlying diseases, we recommend that doctors consider this potentially fatal foodborne infection even in patients with a healthy immune system and no underlying conditions.

Case Presentation

The patient was a 25-year-old Iranian woman who was hospitalized in Shafayahyaeian Hospital, Tehran, Iran, on March 11, 2024, with right shoulder pain 24 days earlier. After taking x-ray photographs, the diagnosis of fracture of the greater tuberosity of the right humerus was raised. The patient underwent fracture fixation with a deltopectoral approach with ETHIBOND EXCEL™ suture. In a one-month follow-up, the patient was recovering and reported no problems. However, she gradually developed pain and restricted movement. In serial radiographs, the greater tuberosity of the humerus was absorbed.

After 3 months, the patient was admitted to the hospital due to pain, restricted movement, and fever with a diagnosis of infection. On June 15, 2024, the sutures were removed. In the second operation, the large tuberosity was completely absorbed, and the patient's symptoms improved.

A tissue culture sample was obtained, which was reported to be *E. tarda*. Before the preparation of culture results, the patient was treated with vancomycin 1 g, twice a day, accompanied by ceftazidime 1 g, thrice a day. With preparation of culture results and consultation with the infectious disease service, the antibiotic treatment regimen of the patient was switched to ciprofloxacin 500 mg, twice a day, as well as clindamycin 300 mg, thrice a day.

In this way, the patient had an uneventful recovery. She was examined for immune and genetic studies, and no immune deficiency-related problems were reported. Past medical history of the patient, except for the computed tomography coronary angiography (CTCA) in the previous month, was unremarkable. She also had no familial history, allergy history, or drug history.

It should be noted that this case report has been written using the CARE (CAse REport) reporting guidelines [5]. Moreover, the verbal and written informed consent were obtained from the patient.

Discussion

E. tarda is a motile anaerobic bacterium of the Enterobacteriaceae family, which is isolated from various animals living in aquatic environments (e.g. reptiles, amphibians, and fish). *E. tarda* is not a part of the normal human flora and rarely causes illness in humans. *E. tarda* infection is regarded as a foodborne infection and is transmitted to humans by eating contaminated food such as raw seafood [6]. The risk factors of *E. tarda* infection include being injured in aquatic environments, certain dietary habits (sushi, fish, and raw meat), immunodeficiency, and chronic diseases such as liver cirrhosis or diabetes [3, 7].

E. tarda bacterial infection in humans can be classified into two types, namely gastrointestinal diseases (80%) and extraintestinal or systemic infections (20%) [3, 7]. Gastrointestinal diseases are among the most common manifestations of this bacterium. Fortunately, the bacterium is sensitive to most antibiotics [6]; nevertheless, severe extraintestinal infections have also been reported, including bacteremia, liver abscess, wound infection, necrotizing fasciitis, osteomyelitis, cholecystitis, endocarditis, and brain abscess, which are potentially life-threatening conditions. The mortality rate of *E. tarda* infection in the case of sepsis reaches 50% [3, 7].

Here we report a case of extraintestinal infection with *E. tarda* in a young patient with unknown underlying or immunodeficiency diseases. This issue demonstrates that *E. tarda* can also cause extraintestinal infection even in immunocompetent patients. This infection is most common in the elderly, with an average age of 61 years [6, 8]. In contrast, our patient was a 25-year-old woman with *E. tarda* infection.

Based on the available studies, *E. tarda* infections have been more common in East Asia, Australia, and North America [6]. However, our patient is one of the few reported cases of extraintestinal infections with this bacterium in Iran. Considering that aquatic animals transmit this pathogen, there is a possibility of more cases of human diseases in Iran [8].

E. tarda bacterium can produce beta-lactamase enzyme, but it is usually sensitive to β-lactam antibiotics [9]. According to previous studies, antibiotics with activity against gram-negative bacilli (aminoglycosides, tetracyclines, fluoroquinolones, etc.) are usually effective on almost all strains of this bacterium [8, 10]. Our patient underwent treatment with vancomycin, accompanied by ceftazidime, before the results of the culture were determined. Afterwards, based on the results of culture and consultation with an infectious diseases specialist, the patient's antibiotic treatment regimen was changed to ciprofloxacin and clindamycin, which led to the improvement of the patient's symptoms.

Conclusions

E. tarda, although infrequently encountered as a human pathogen, can cause severe extraintestinal infections with varied clinical presentations. Our investigation reveals that *E. tarda* can affect immunocompetent patients, thereby suggesting that *E. tarda* should be regarded as a potentially significant pathogen, particularly in immunocompromised individuals without underlying diseases.

Ethical Considerations

Compliance with ethical guidelines

Verbal and written informed consent were obtained from the patient to write and publish this report.

Funding

This study was performed with the support of Iran University of Medical Sciences, Tehran, Iran.

Authors' contributions

Conceptualization: Morteza Nakhaei Amroodi, Babak Roshanravan, Saeedreza Amiri, and Pouria Tabrizian; Methodology: Morteza Nakhaei Amroodi, Mojtaba Baniasadi, Amir Sobhani, Saeedreza Amiri, and Pouria Tabrizian; Formal analysis and investigation: Morteza Nakhaei Amroodi, Babak Roshanravan, Amir Sobhani, and Mojtaba Baniasadi; Writing the original draft: Morteza Nakhaei Amroodi, Babak Roshanravan, and Mojtaba Baniasadi; Review and editing: All authors; Supervision: Saeedreza Amiri and Pouria Tabrizian.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgments

The authors appreciate the support of Iran University of Medical Sciences, Tehran, Iran. The authors also thank the patient for her consent to release information and clinical photographs for the writing of this article.

References

[1] Bockemühl J, Pan-Urai R, Burkhardt F. Edwardsiella tarda associated with human disease. Pathobiology. 1971; 37(5):393-401. [DOI:10.1159/000162341]

[2] Ota K, Yamanoue H, Aizawa N, Suzuki N, Ota K, Takasu A. Gastric submucosal abscess caused by Edwardsiella tarda infection: A case report. BMC Gastroenterol. 2020; 20(1):299. [DOI:10.1186/s12876-020-01446-1] [PMID]

[3] Ding Y, Men W. A case report and review of acute cholangitis with septic shock induced by Edwardsiella tarda. Ann Clin Microbiol Antimicrob. 2022; 21(1):33. [DOI:10.1186/s12941-022-00524-4] [PMID]

[4] Wang IK, Kuo HL, Chen YM, Lin CL, Chang HY, Chuang FR, et al. Extraintestinal manifestations of Edwardsiella tarda infection. Int J Clin Pract. 2005; 59(8):917-21. [DOI:10.1111/j.1742-1241.2005.00527.x] [PMID]

[5] Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D, et al. The CARE Guidelines: Consensus-based Clinical Case Reporting Guideline Development. Glob Adv Health Med. 2013; 2(5):38-43. [DOI:10.7453/gahmj.2013.008] [PMID]

[6] Hirai Y, Asahata-Tago S, Ainoda Y, Fujita T, Kikuchi K. Edwardsiella tarda bacteremia. A rare but fatal water-and foodborne infection: Review of the literature and clinical cases from a single centre. Can J Infect Dis Med Microbiol. 2015; 26(6):313-8. [DOI:10.1155/2015/702615] [PMID]

[7] Suzuki K, Yanai M, Hayashi Y, Otsuka H, Kato K, Soma M. Edwardsiella tarda bacteremia with psoas and epidural abscess as a foodborne infection: A case report and literature review. Intern Med. 2018; 57(6):893-7. [DOI:10.2169/internalmedicine.9314-17] [PMID]

[8] Gilani A, Sarmadian R, Kahbazi M, Yousefichaijan P. Urinary tract infection caused by Edwardsiella tarda: A report of the first case in Iran. BMC Infect Dis. 2022; 22(1):962. [DOI:10.1186/s12879-022-07960-9] [PMID]

[9] Ota T, Nakano Y, Nishi M, Matsuno S, Kawashima H, Nakagawa T, et al. A Case of Liver Abscess Caused by Edwardsiella tardaa. Intern Med. 2011; 50(13):1439-42. [DOI:10.2169/internalmedicine.50.5297] [PMID]

[10] Tamada T, Koganemaru H, Matsumoto K, Hitomi S. Urosepsis caused by Edwardsiella tarda. J Infect Chemother. 2009; 15(3):191-4. [DOI:10.1007/s10156-009-0678-8] [PMID]