Case Report

Catheter-Related ESBL-Producing *Leclercia adecarboxylata* Septicemia in Hemodialysis Patient: An Emerging Pathogen?

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19 October 2019; Accepted 6 January 2020; Published 22 January 2020

1. Introduction

*Leclercia adecarboxylata* is a motile, Gram-negative, oxidase-negative bacterium, which was first described by Leclerc in 1962 as *Escherichia adecarboxylata* [1]. Based on nucleic acid and protein electrophoretic techniques, “*E. adecarboxylata*” was separated from the “*Enterobacter agglomerans*” complex [2] to which it was assigned temporarily and renamed *Leclercia adecarboxylata* [3]. This bacterium was isolated from environmental samples, including water and soil [4]. However, a cumulative report of human infections by *L. adecarboxylata* mostly in immunocompromised patients suggested that the organism is an opportunistic bacterium and the infections caused by it are underestimated. It has been reported to cause septicemia [5], wound infection [6, 7], urinary tract infection [8, 9], posttraumatic polymicrobial infection [10], soft tissue infection [11], and peritonitis [12]. The majority of clinical isolates of *L. adecarboxylata* were susceptible to commonly used antibiotics [4], and multidrug-resistant isolates have rarely been reported [8]. Here, we report a case of extended-spectrum beta-lactamase-producing *L. adecarboxylata* from a patient with catheter-related septicemia.

2. Case Report

A 50-year-old female patient with a known case of diabetes mellitus and end-stage renal disease due to hypertension was started on hemodialysis in March 2014. Permanent tunneled catheters were placed into the right internal jugular vein as the patient was not fit for AVF creation due to vascular occlusions.

On 7 April 2019, at the end of a dialysis session, the patient developed fever (39°C) and chills. Fever was documented at 39°C, was associated with chills and rigors, and was not responding to antipyretics. In the emergency department, the patient reported no change in weight, loss of appetite, or night sweats. She denied any history of respiratory, gastrointestinal, neurological symptoms. On examination, the temperature was 39°C, the blood pressure 150/75 mm Hg, the heart rate 110 beats per minute, and the respiratory rate 18 breaths per minute. The patient was fully conscious and oriented. The remainder of the general medical examination was normal.

She was admitted to our nephrology unit with possible source catheter-related blood stream infection. She was started on ceftazidime 2 gm IV once daily and vancomycin 1 gm IV Q HD as per the protocol. The white blood cell
and then she was discharged in good condition. The patient received meropenem and gentamicin for two weeks, and additional susceptibility tests (ASTs) from blood cultures. His treatment regimen was changed to meropenem (≤500mg IV once daily) and gentamicin based on antibiotic sensitivities.

Among carbapenems, it was susceptible to all quinolones and cephalosporins. But it was susceptible to all quinolones and cephalosporins. In this case, the strain was resistant to most beta-lactams, including narrow, expanded, and broad-spectrum cephalosporins. It was susceptible to all quinolones and carbapenems tested.

The treatment regimen was changed to meropenem 500mg IV once daily and gentamicin based on antibiotic susceptibility testing results. This targeted therapy was successful, and the patient became afebrile. The patient received meropenem and gentamicin for two weeks, and then she was discharged in good condition.

3. Discussion

*L. adecarboxylata* is a Gram-negative bacillus belonging to the Enterobacteriaceae family. The association of *L. adecarboxylata* with catheter (particularly tunnelled CVC) related septicemia is increasingly reported [13]. In 2013, De Mauri and colleagues reported that there were 15 reports of adult patients with catheter-related septicemia due to *L. adecarboxylata* [5]. Bacterial resistance to antibiotics is increasing worldwide in healthcare settings and in the community. The dissemination of extended-spectrum beta-lactamase Enterobacteriaceae (ESBL-E) is alarming [14]. Antibiotic-resistant *L. adecarboxylata* strains have been reported in six different cases. Of these cases, only two were extended-beta-lactamase producer isolates. The first case from a patient with acute myeloid leukaemia produced ESBL. This strain encoded SHV-type beta-lactamases [15]. The second case was ESBL producing a multidrug-resistant *L. adecarboxylata* strain harbouring blaTEM-1, blaCTX-M-3, and intI1 cassette (dfrA12-orfF-aadA2) genes in a 47-year-old female with breast cancer [16]. Although *L. adecarboxylata* has been recognized as a relatively insignificant human pathogen due to its low virulence and high antibiotic susceptibility, multidrug-resistant strains can become life-threatening human bacterial pathogens by acquiring genetic determinants, including blaSHV, blaTEM-1, blaCTX-M group 1, and intI1 genes. Of note, *L. adecarboxylata* is an uncommon isolate in microbiology laboratories, but it will likely be more often identified with new diagnostic techniques.

In conclusion, we report the third case of catheter-related septicemia due to ESBL producing a multidrug-resistant *L. adecarboxylata* strain in a 50-year-old female with end-stage renal disease.

### Data Availability

The authors declare that this article does not show the name or data of the patient.

### Consent

Written informed consent was obtained from the patient.

### Conflicts of Interest

The authors declare no conflicts of interest.

### References

[1] H. Leclerc, “Biochemical study of pigmented Enterobacteriaceae,” *Annales de l’Institut Pasteur*, vol. 102, pp. 726–741, 1962.

[2] D. Izard, J. Mergaert, F. Gavini et al., “Separation of *Escherichia adecarboxylata* from the ‘Erwinia herbicola-Enterobacter agglomerans’ complex and from the other Enterobacteriaceae by nucleic acid and protein electrophoretic techniques,” *Annales de l’Institut Pasteur*, vol. 136, pp. 151–168, 1985.

[3] K. Tamura, R. Sakazaki, Y. Kosako, and E. Yoshizaki, “Leclercia adecarboxylata Gen. Nov., Comb. Nov., formerly known as*Escherichia adecarboxylata*,” *Current Microbiology*, vol. 13, no. 4, pp. 179–184, 1986.

[4] I. Stock, S. Burak, and B. Wiedemann, “Natural antimicrobial susceptibility patterns and biochemical profiles of *Leclercia adecarboxylata* strains,” *Clinical Microbiology and Infection*, vol. 10, no. 8, pp. 724–733, 2004.

[5] A. De Mauri, D. Chiarinotti, S. Andreoni, G. L. Molinari, N. Conti, and M. De Leo, “Leclercia adecarboxylata and catheter-related bacteremia: review of the literature and outcome with regard to catheters and patients,” *Journal of Medical Microbiology*, vol. 62, no. 10, pp. 1620–1623, 2013.

[6] E. H. Hurley, E. Cohen, J. A. Katarincic, and R. K. Ohnmacht, “Leclercia Adecarboxylata Infection in an immunocompetent child,” *Rhode Island Medical Journal*, vol. 98, no. 9, pp. 41–44, 2015.

[7] Z. Temesgen, D. R. Toal, and F. R. Cockerill III, “Leclercia adecarboxylata infections: case report and review,” *Clinical Infectious Diseases*, vol. 25, no. 1, pp. 79–81, 1997.

[8] A. Makanera, M. Conde, M. A. Diallo et al., “A multi-drug resistance pattern of,” *International Journal of Biological and Chemical Sciences*, vol. 12, no. 4, p. 1550, 2018.

[9] H. Sawamura, Y. Kawamura, M. Yasuda et al., “A clinical isolate of *Leclercia adecarboxylata* from a patient of...
pyelonephritis,” Journal of the Japanese Association for Infectious Diseases, vol. 79, no. 10, pp. 831–835, 2014.

[10] J. D. Forrester, J. Adams, and R. G. Sawyer, “Leclercia adecarboxylata bacteremia in a trauma patient: case report and review of the literature,” Surgical Infections, vol. 13, no. 1, pp. 63–66, 2012.

[11] C. A. Botero-García, C. H. Gómez, J. S. Bravo, and L. A. Pescador Vargas, “Leclercia adecarboxylata, a rare cause of soft tissue infections in immunocompromised patients, case report and review of the literature,” Infectio, vol. 22, no. 4, p. 223, 2018.

[12] H. M. Kim, C. Y. Chon, S. H. Ahn et al., “Fatal spontaneous bacterial peritonitis by Leclercia adecarboxylata in a patient with hepatocellular carcinoma,” International Journal of Clinical Practice, vol. 62, no. 8, pp. 1296–1298, 2008.

[13] M. F. Fernandez-Ruiz, L. Lopez-Medrano, A. Garcia-Sanchez et al., “Successful management of tunneled hemodialysis catheter-related bacteremia by Leclercia adecarboxylata 166 without catheter removal: report of two cases,” International Journal of Infectious Diseases, vol. 13, pp. e517–e518, 2009.

[14] J. D. Pitout and K. B. Laupland, “Extended-spectrum β-lactamase-producing Enterobacteriaceae: an emerging public-health concern,” The Lancet Infectious Diseases, vol. 8, no. 3, pp. 159–166, 2008.

[15] A. Mazzariol, J. Zuliani, R. Fontana, and G. Cornaglia, “Isolation from blood culture of a Leclercia adecarboxylata strain producing an SHV-12 extended-spectrum beta-lactamase,” Journal of Clinical Microbiology, vol. 41, no. 4, pp. 1738-1739, 2003.

[16] G. W. Shin, M. J. You, H. S. Lee, and C. S. Lee, “Catheter-related bacteremia caused by multidrug-resistant Leclercia adecarboxylata in a patient with breast cancer,” Journal of Clinical Microbiology, vol. 50, no. 9, pp. 3129–3132, 2012.