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Case Report Open Access

Tunneled Hemodialysis Catheter's Infection by *Leclercia Adecarboxylata*: First Case Report in Colombia

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Abstract

Introduction: *Leclercia adecarboxylata* is an opportunistic gram-negative bacillus from the enterobacteria group, rarely isolated. It is generally reported as a single infection in immunosuppressed patients and less frequently in poly-microbial cultures in immune-competent patients.

Clinical case: 60-years-old male with chronic kidney disease in haemodialysis since 2010, first by arteriovenous fistula and since 2014 by right jugular tunnelled catheter. During a session of haemodialysis, he presents an episode of chills and fever without apparent infectious focus; infection of catheter is suspected. Blood cultures are ordered, as well as beginning empirical therapy with vancomycin and amikacin via catheter. Blood cultures reported multi-sensible *Leclercia adecarboxylata*, presenting a good clinical response and negative blood cultures after treatment.

Discussion: *L. adecarboxylata* is an unusually isolated pathogen in sepsis by haemodialysis's catheter and understudied in the literature. The importance of our case consists in being the first report in Colombia. The experience in other reports of this microorganism suggests that it has successful results with antibiotic treatment and no there's no need to remove the catheter.

Keywords: *Leclercia adecarboxylata*; Renal insufficiency chronic; Renal dialysis; Bacteremia

Introduction

Leclercia adecarboxylata is a gram-negative bacillus of the Enterobacteriaceae family and gender Leclercia. It is an opportunistic bacterium, which is part of the intestinal flora of humans and animals [1,2]. The infection caused by this pathogen and their association with bacteremia is rare [3]. There have been case reports in adults with infected ulcers, urinary tract infections, infections in immune-compromised hosts and poly-microbial sepsis. Publications related to this organism are rare and may be due to the difficulty of its microbiological identifying, clinical assessment and ignorance of their nosocomial epidemiological behavior [2,4-6]. *L. adecarboxylata* is very sensitive to broad-spectrum antibiotics, including most beta-lactams, aminoglycosides and quinolones. However, two cases have been reported of antibiotic resistance, which are related to beta-lactamase producing strains [3]. We report the case of a patient with chronic kidney disease due to hypertension in haemodialysis therapy to whom we had this pathogen isolated on two blood cultures after presenting clinical symptoms of chills and fever during a haemodialysis session.

Presentation of the Case

60 years old, male patient, born in Sincerín, Bolivar, with an history of chronic kidney disease and ischemic heart disease of hypertensive etiology, who has been in haemodialysis three times a week since July 1, 2010. On January 20, 2011 a left radical nephrectomy plus splenectomy was performed because of a malignant renal tumor, without additional therapies. He started haemodialysis therapy with a temporary catheter in the first time, and then with a left arteriovenous fistula (AVF) that was closed on July 25, 2014 due to ulceration and bleeding. A new right AVF is opened but it had early thrombosis. He continued his treatment with a temporary catheter and since August 12, 2014 through a permanent right jugular tunneled catheter. On September 9, 2015, during a session of haemodialysis, he presented a clinical episode of chills associated with unquantified fever with no apparent focus of infection. At the physical exam, the vital signs showed: BP: 100/62 mmHg, FC: 69X', FR: 19X', weight: 89 kg, height: 175 cm, BMI: 29 kg/m. The patient was in regular general condition, conscious, oriented, alert, isochoric and reactive to light pupils; with fever and chills present, normocephalic, wet and clammy skin, wet and pink oral mucous membranes. In the neck, he had the catheter in the right internal jugular vein. The exam of the thorax, abdomen and genitourinary system were within normal parameters, without positive findings. The extremities were symmetrical, eutrophic and without edema. The central nervous system didn't have apparent motor or sensory deficit.

An infection of haemodialysis catheter was suspected; blood cultures were ordered and the patient began antibiotic therapy with vancomycin (1 g via intravenous post dialysis, five doses) and amikacin (iniciate with 300 mg via intravenous post dialysis, followed by five additional doses of 150 mg via intravenous), for a total treatment of 2 weeks. On September 18, 2015 blood culture results reported *Leclercia adecarboxylata*, sensitive to imipenem, ciprofloxacin, amikacin, gentamicin, meropenem, ceftriaxiona, piperaclina, tazobactam, among

others; no resistance was reported. Due to satisfactory clinical outcome it was decided to complete the initial scheme; control blood cultures one week after the end of the treatment were negative.

This patient has a history of systemic hypertension since 1990 and an evolution of more than 15 years of a chronic kidney disease. He started renal replacement therapy on July 01, 2010, after presenting a worsening of renal failure with a hypertensive crisis emergency, and uremic encephalopathy. Due to hematuria and suspected nephrolithiasis, a CT urography is performed and a left renal mass was found. He presented on July 21, 2010 a community-acquired lung sepsis with pneumonia and right heart failure with atrial fibrillation that were properly treated.

About his surgical history, a left AVF were put on August 19, 2010 and was closed on July 25, 2014 by bleeding and chronic left vein brachiocephalic trunk thrombosis. He was subjected to a radical left nephrectomy plus splenectomy on January 20, 2011. During the procedure, the patient had a hemorrhagic shock intraoperatively, requiring a transfusion of 2 packed red blood cells unites and ICU management with recovery. A Laparoscopic cholecystectomy for cholelithiasis was performed on February 14, 2014 without complications during the procedure. Some AVF and temporary catheters were installed, but they weren't functional. A permanent catheter placed on right internal jugular was put on August 12, 2014, and is still functional to this day.

The paraclinical results at September 1, 2015 (as part of his disease control) showed: potassium 5.59 mEq/L (VR: 3.7-5.2); albumin 4.39 g/dL (VR: 3.4-5.4); blood count: hemoglobin 12 g/dL (VR>10), leukocytes: 11010, neutrophils: 59.3%, platelets: 254000; mineral bone metabolism: calcium 10.08 mg/dL (VR: 8.5-10.5); phosphorus 5.7 mg/dL (VR: 2.5-4.5), iPTH: 904.6 pg/ml (<250), alkaline phosphatase: 153 IU/L (VR<120), transaminases: GPT: 10.7 IU/L (VR 8-35), GOT: 12 IU/L (VR: 8-30), lipid company: HDL: 31.5 mg/dl (VR>40), LDL: 64.84 mg/dl (VR<190), CT: 133.9 mg/dl (VR<200), TGL: 162.8 mg/dl (VR<200).

He is being treated with Omeprazole 1 capsule 20 mg orally daily, acetylsalicylic acid 1 tablet 100 mg orally daily, Lovastatin 1 tablet 20 mg orally daily, Sevelamer hydrochloride 1 tablets 800 mg orally at lunch and dinner.

Discussion

L. adecarboxylata infections are rare, appearing in most cases in immune-compromised or with underlying conditions adults, and less frequently as part of poly-microbial infections in immunocompetent hosts, which is why it is considered an opportunistic pathogen [1,3,5,7-10]. It is distributed in an ubiquitously way in nature and has been isolated in various clinical samples such as blood, sputum, wounds, food, water and other environmental sources, as well as skin and gastrointestinal tract of normal humans [1,5,6].

Isolated *L. adecarboxylata* species are generally sensitive to multiple antibiotics, although the co-existence with some multiresistant organisms can generate the transmission of different resistance elements [6]. In most cases, patients recover after four weeks of antimicrobial treatment without having any sequels, as it happened with our patient [5].

Infections of central venous catheter (CVC) by *L. adecarboxylata* in haemodialysis patients are very rare, hence the exceptional nature of this case. After a systematic review in PubMed, Scopus, Clinical Key and EBSCO Host using as keywords "*Leclercia adecarboxylata*" + "renal dialysis" + "catheter", we can say that this is the first case reported in Colombia and the fourth in the world.

Fernandez-Ruiz et al. described the first case of infection by *L. adecarboxylata* in a man with CVC; it was an 81-year-old patient with chronic kidney disease grade 5, secondary to diabetes mellitus and renal adenocarcinoma who underwent a radical nephrectomy in 1999. He was on haemodialysis since 2005 through right subclavian vein CVC, and in June 2006 he presented fever after a haemodialysis session; blood cultures reported *L. adecarboxylata*. He was treated with ciprofloxacin 2 mg/ml, sodium heparin (20 IU/ml) and IV ceftriaxiona 2 g every 24 hours for 15 days.

The same author described another case of a male patient of 72 years who was subject of a kidney transplant in 2005 for ESRD due to hypertension, who began hemodialysis in 2006 due to a graft failure. He had also received an orthotropic heart transplant in 1991 and was in immunosuppressive therapy with prednisone, mycophenolate mofetil, and rapamycin. CVC was placed in the left subclavian vein in April 2008; four months later he presented temperature of 38.6°C and sweating, blood culture reported *L. adecarboxylata*; He was treated with gentamicin 2 mg/ml, sodium heparin (20 IU/ml), followed by 15 days of treatment with Meropenem 500 mg IV every 24 hours. In both cases negative cultures were subsequently obtained, with improvement of symptoms and without removing the catheter [11].

In 2011, Marina et al described the case of a male patient of 58 years with secondary end-stage renal disease by diabetic nephrosclerosis, who since 2010 received hemodialysis via CVC in the left internal jugular vein. A low-grade fever was presented after one hemodialysis session; the blood culture reported *L. adecarboxylata*. The catheter was removed and the bacteremia resolved without antibiotic therapy [12].

In accordance with the exposed cases, the patient of this report is a male of 60 years with chronic kidney disease secondary to hypertensive nephropathy, subjected to splenectomy and left radical nephrectomy for renal cancer in 2011, on hemodialysis since 2010 by AVF and since August 2014 through tunneled catheter in right internal jugular. He presented on September 9, 2015 an episode of chills and fever without any another focus of infection. He received symptomatic management and empirical antibiotic treatment with vancomycin and amikacin, after taking blood cultures of peripheral and Trans catheter blood. Both blood cultures results reported *L. adecarboxylata* multisusceptible, including amikacin. The patient showed clinical improvement with prescribed therapy for two weeks taking into account the late report of blood cultures, without the need to remove the catheter and without sequels related to the infectious process. Nowadays, he continues his haemodialysis using the same catheter; no new infections have been presented.

In our case, beside the state of immunocompromise due to chronic kidney disease and a risk factor for bacteremia as it is the use of a catheter for vascular access, we must take into account that he was subjected to a splenectomy which increases the susceptibility of infection by gram positive and gram negative bacteria, including mainly Neisseria meningitidis and Haemophilus influenza, and others such as Escherichia coli and Pseudomonas aeruginosa. *Leclercia adecarboxylata* is a gram-negative bacillus, so splenectomy is not ruled out as an additional risk factor [13].

Therefore, it can be concluded that the lack of knowledge about the behavior and identification of this organism is the reason why few cases have been diagnosed, and thanks to the wide antibiotic sensitivity

that *L. adecarboxylata* presents, different treatments with various antibiotics obtain a resolution of the infection without removing the catheter and without sequels for the patient.

Analysis of the Case

This patient went through an infection of tunneled haemodialysis catheter by a bacterium with a great antibiotic sensitivity, *Leclercia adecarboxylata*. Control blood cultures performed after the treatment with vancomycin and amikacin was completed were negative. The clinical outcomes were satisfactory, with disappearance of episodes of chills and fever within 48 hours with successful empiric treatment, which the isolated germ was sensitive, preserving the valuable haemodialysis catheter in this patient without native vascular access.

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