Listeria Monocytogenes Meningitis in a Renal Transplant Recipient - A Case Report

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Abstract

Gastrointestinal tract is the main entry for Listeria monocytogenes. Thus, the most common manifestation of infection is enteritis, but meningitis and meningoencephalitis may also occur. Unless recognized and treated, Listeria infections can result in significant morbidity and mortality, especially in immunocompromised hosts. We report a case of Listeria monocytogenes meningitis in a renal transplant recipient successfully treated with ampicillin. The patient recovered completely with stable graft function.

Key words: listeria monocytogenes, meningitis, renal transplantation, immunosuppressive therapy

Introduction

Listeria monocytogenes is an aerobic and facultative anaerobic, Gram-positive, motile, nonspore-forming bacillus commonly found in soil, water, sewage, and wild and domestic animals [1]. The most common manifestations of L. monocytogenes infection include enteritis, meningitis, and meningoencephalitis. Infection may also present as a fever of unknown origin or as subacute bacterial endocarditis [2].

It is typically a food-borne organism. Often the port of entry for L. monocytogenes is the gastrointestinal tract, where it may manifest initially as enteritis [3]. The most common clinical manifestation is diarrhea. A mild presentation of fever, nausea, vomiting, and diarrhea may resemble a gastrointestinal illness. The microorganism has gained recognition because of its association with epidemic gastroenteritis. Bacteremia and meningitis are more serious manifestations of disease that can affect individuals at high risk. Unless recognized and treated, Listeria infections can result in significant morbidity and mortality. It is the third most common cause of acute bacterial meningitis in Western World countries, responsible for 4-12% of all reported cases [4-6]. The case fatality rate of Listeria meningitis in adults remains high (17-27%) and important neurologic consequences in adult survivors have been reported [7,8].

Case report

A 62-year-old woman presented in emergency unit with 2-day history of fever, and on the day of admission vomiting and headache with two episodes of diarrhea. She had a history of polycystic renal disease and had started with hemodialysis treatment in 1996. In 1997 aneurysm of internal carotid artery was found and treated surgically, but postoperative period was complicated when the patient developed ischaemic stroke with a left-sided hemiparesis. She was also diagnosed with disorders of pituitary gland function and had received hydrocortisone substitution therapy.

In February 2007 she received renal allograft from a deceased donor. Immunosuppressive therapy included corticosteroids, mycophenolate mofetil and cyclosporine. Two years later she developed endometrial carcinoma, which was surgically treated and cyclosporine was replaced with sirolimus.

At the time of admission to the hospital her temperature was 38°C, she did not have nuchal rigidity or photophobia and except for the already mentioned left-sided hemiparesis she had no other neurological findings. The peripheral leukocyte count was 7.640 cells/mm³ (neutrophils 74%, 4% band and 16% lymphocytes) and C-reactive protein was 26 mg/L. A non-contrast computed tomography (CT) examination of the head was unremarkable. Empirical therapy with ciprofloxacin intravenously (iv.) was started and corticosteroids were excluded from the therapy.

Two days later the patient’s condition deteriorated and Listeria monocytogenes was isolated from blood cultures. Antimicrobial therapy was changed into ampicillin 6x2 g iv. and gentamicin 160 mg iv. The patient was transferred into the Intensive care unit of University hospital for infectious disease. A lumbar puncture was performed...
and cerebrospinal fluid contained 195 cells/mm³ (30% neutrophils), a protein level of 4749 mg/L, and glucose level 4.6 mmol/l (serum glucose 12.6 mmol/l). PCR of cerebrospinal fluid was positive for *Listeria monocytogenes*. Control CT scan remained unremarkable. Cardiological ultrasound was also performed but no signs of endocarditis were found.

The patient was treated with ampicillin over the next 28 days in combination with gentamicin 160 mg iv during the first week. After that oral therapy with trimethoprim-sulfamethoxazole (TMP-SMX) 2x960 mg during two weeks was given. When antibiotic therapy was finished the patient was discharged from the hospital in a good condition without any new neurological findings. Renal allograft function remained stable.

**Discussion**

Listeriosis is a foodborne infection caused by *Listeria monocytogenes* that presents with sepsis-like syndrome or an acute-to-subacute central nervous system infection, mostly meningitis, with a 20-30% mortality despite adequate treatment [12]. *Listeria monocytogenes*, although an uncommon cause of illness in the general population, is an important pathogen in pregnant patients, neonates, and elderly individuals, patients with cancer, particularly hematologic cancers, and immunocompromised individuals as our patient was. Early administration of adequate antimicrobial therapy is the cornerstone of treatment in patients with meningitis. However, despite developments in antimicrobial agents, infection with *L. monocytogenes* remains a serious disease that carries high morbidity and mortality rates. No controlled trials exist to establish a drug of choice, mode of delivery, or optimal duration of therapy for listeriosis of the central nervous system, especially not for immunocompromised patients [13]. Ampicillin is the preferred and most widely used agent; many authorities recommend the addition of an aminoglycoside to ampicillin during the first week of treatment of CNS infection [14,15]. For patients with penicillin hypersensitivity, TMP-SMX is the treatment of choice [16,17]. We had a good experience with a long-term treatment with ampicillin in addition with aminoglycosides and after intravenous therapy we continued oral therapy with TMP-SMX because our patient was under immunosuppressive therapy. But further studies should focus on specific intervention (eg. adjuvant therapies) that could help improve the poor prognosis of these patients.

Several cases of *L. monocytogenes* meningitis and brain abscess in renal transplant recipients have been described in the literature [18-24]. Mortality rates were high. Magnetic resonance imaging was suggested for precise evaluation of intracranial pathology [18]. Unfortunately, MRI was not available at our Clinic for infectious diseases, and the patient’s condition was too poor for transportation. Thus, our patient had only CT scans, which were unremarkable. In conclusion, *L. monocytogenes* is a rare but dangerous pathogen in renal transplant recipients. Fast diagnosis, targeted antimicrobial therapy and reduction of immunosuppression are mandatory for favorable outcome.

**Conflict of interest statement.** None declared.

**References**

