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Pleural effusion caused by infection with *Listeria monocytogenes*: etiopathogenesis and treatment

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TO THE EDITOR:

Listeria monocytogenes is a gram-positive rod that is commonly found in soil, water, and the fecal flora of many mammals.[1] In at-risk groups, including neonates, pregnant women, and elderly individuals, and immunocompromise individuals, such as those with underlying malignancies, those receiving immunosuppressive therapy, and those infected with HIV, the most common presentations of *L. monocytogenes* infection are sepsis and meningitis.[2,3] Pleural infection by this pathogen is extremely rare.[1-7] Only approximately 20 such cases have been reported, most of those were in immunocompromised patients with hematologic malignancies,[3,6,8] although at least three cases have been reported in patients with liver cirrhosis.[2,3]

A 63-year-old woman, previously diagnosed with Evans syndrome (treated chronically with 5 mg/day of methylprednisolone), class III obesity with marked lipodystrophy, heart failure, and autoimmune hepatitis-related cirrhosis, presented to our hospital with a five-day history of right pleuritic chest pain and shortness of breath. At presentation, she was afebrile. Physical examination revealed diminished breath sounds over the lower two-thirds of the right chest. Laboratory tests showed normocytic normochromic anemia (hemoglobin of 9.9 g/dL), leukocytosis (14.8 × 10^3 leukocytes/μL), thrombocytopenia (78 × 10^3 cells/μL), C-reactive protein level of 18 mg/dL, lactate dehydrogenase of 156 U/L, creatinine of 1.6 mg/dL, gamma-glutamyl transpeptidase of 155 U/L, alkaline phosphatase of 153 U/L, hypoalbuminemia (serum albumin of 2.4 g/dL), and negative serology for HIV. A chest X-ray showed right pleural effusion of moderate volume (Figures 1A and 1B). The patient was admitted to the hospital for etiological investigation of the pleural effusion.

Diagnostic ultrasound-guided thoracentesis was carried out. Analysis of the pleural fluid revealed exudates with a pH of 7.3, 5.7 g/dL of proteins, 45 mg/dL of glucose, 324 U/L of lactate dehydrogenase, and an abnormal complete blood count (abundance of erythrocytes). There was no malignancy, Ziehl-Neelsen staining was negative, and gram staining was positive. A chest tube was inserted and connected to an underwater seal drainage system, which yielded bloody fluid. *L. monocytogenes* was isolated from a culture of the pleural fluid and from blood cultures, although not in a culture of cerebrospinal fluid aspirate. Neither ascites nor neurologic manifestations were present, although there have been reports of peritonitis and meningoencephalitis accompanying pleural effusion caused by *L. monocytogenes* infection. The patient also underwent CT scans of the brain and abdomen, neither of which showed any acute abnormalities. There was no relevant epidemiological context in her community. A second culture of pleural fluid was positive for *L. monocytogenes*, thus confirming the previous results. A CT scan of the chest showed massive right pleural effusion (Figure 1C).

The initial treatment was intravenous ampicillin (2 g every 4 h) and adjuvant oral trimethoprim-sulfamethoxazole, based on evidence in the literature. After 7 days, the patient developed myelotoxicity and the trimethoprim-sulfamethoxazole was therefore replaced with gentamicin. The patient completed 14 days of treatment, which resulted in favorable clinical and radiological responses.

It should be noted that our patient had chronic liver disease and was under treatment with an oral corticosteroid, two conditions that could have been predisposing factors for invasive listeriosis.[2,3] Although there is no consensus regarding the mechanism by which *L. monocytogenes* enters the pleural cavity, hematogenous spread and subsequent seeding to the pleura was the most probable route of infection in the case presented here.

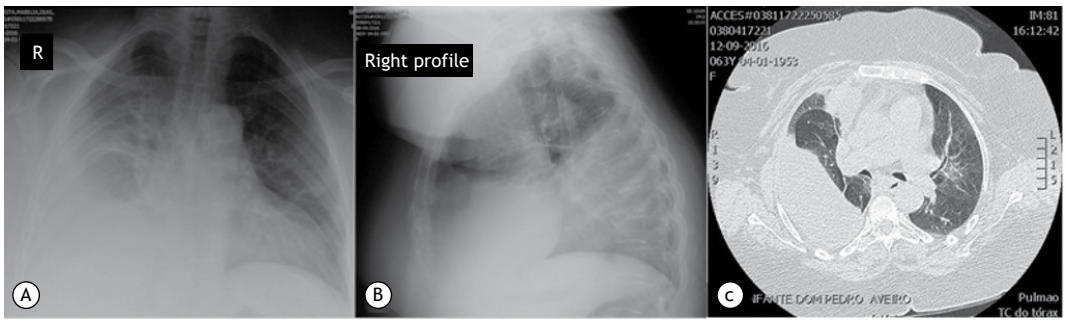

Figure 1. Chest X-ray in posteroanterior and right lateral views (A and B, respectively), showing right-sided pleural effusion. A CT scan of the chest (in C), showing massive right-sided pleural effusion.

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A case series involving nine patients reported an overall mortality rate of 44.4%,[6] and mortality appeared to be lower for the patients who were treated with an aminoglycoside combined with penicillin or ampicillin and for those who underwent drainage of pleural fluid.[1,2,6,7] Because of the small number of cases, the prognosis for patients with pleural effusion caused by *L. monocytogenes* infection is unknown, although rapid diagnosis, prompt institution of appropriate antimicrobial therapy, and effective drainage of pleural fluid are likely to improve chances of survival.[1,2,6]

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