

Meningitis Caused by *Alcaligenes xylosoxidans* in a Patient with HIV/AIDS

F. Espinoza-Gómez^{1,2}, O.A. Newton-Sánchez², V. Melnikov², O. Virgen-González¹ and J. Unrau²

¹Hospital Regional Universitario, Secretaría de Salud y Bienestar Social del Estado de Colima; ²Facultad de Medicina de la Universidad de Colima; Colima, Mexico

The purpose of the present work was to inform about the first case of meningitis associated to the bacteria *Alcaligenes xylosoxidans* in a patient with HIV/AIDS. The patient was a 46-year-old male, with the antecedent of have been diagnosed for HIV/AIDS, who attended in the Hospital Universitario de Colima, Mexico, with fever, shock and meningismus. The study of the cerebrospinal fluid showed pleocytosis, elevated protein levels and hypoglycorrachia. The culture yielded the presence of *Alcaligenes xylosoxidans* with sensitivity to ciprofloxacin. After 14 days of treatment with this antibiotic, the patient showed neurologic improvement and was able to continue with his outpatient antiretroviral treatment. The present case shows the importance of the inclusion of this bacterium in the differential diagnosis of the neurological infections in HIV/AIDS patients and emphasizes the importance of considering the bacterial meningitis in this population.

Key words: Meningitis, *Alcaligenes xylosoxidans*, HIV/AIDS.

Central nervous system (CNS) infections constitute one of the most serious problems in patients infected with the human immunodeficiency virus or with acquired immunodeficiency syndrome (HIV/AIDS). The most frequently involved microorganisms are: *Mycobacterium tuberculosis*, *Cryptococcus neoformans* and *Toxoplasma gondii* (90%) [1], in addition to fungi such as *Aspergillus fumigatus*, *Nocardia asteroides*, *Histoplasma capsulatum* and viruses from the Herpesvirus and Cytomegalovirus families or HIV itself [2], as well as disease by prions like Creutzfeldt-Jakob.

With the exception of tuberculosis, bacterial CNS infections in patients with AIDS are relatively rare but deserve special attention due to their particularly aggressive behavior. Their timely diagnosis results in significant recovery rates when adequate antibiotics are used. Among AIDS patients, the following non-tuberculosis bacterial neurological infections have been reported: *Streptococcus pyogenes*, *H. influenzae*, *Neisseria meningitidis*, *S. pneumoniae*, *E. coli*, *Salmonella sp.*, *Treponema pallidum*, *Enterococcus faecalis*, *Listeria monocitogenes* and *Bacteroides fragilis* [3,4].

Alcaligenes xylosoxidans, also known as *Achromobacter xylosoxidans*, is a Gram-negative, non-glucose-fermenting, aerobic, oxidase- and catalase-positive bacterium, frequently isolated from aqueous environments [5]. It sporadically causes disease in humans, particularly nosocomial infections in immune suppressed patients and newborns, manifested as chronic purulent otitis, keratitis, bacteremia, meningitis, urinary tract infections and osteomyelitis [6-9]. In patients with AIDS, some cases of

pneumonia, pulmonary abscess and bacteremia caused by these bacteria have been documented [10,11]. However, after consulting the medical literature (Medline, Current Contents and EMBASE), during the period comprised between 1982 and 2006, it was not possible to find any report of neurological infection attributable to this bacterium in patients with AIDS. For this reason, we report the first case of meningitis caused by apparently community-acquired *A. xylosoxidans*, in a patient with HIV/AIDS.

Case Report

Forty-six-year-old male, farmer, with a history of homosexual practices, diagnosed with AIDS five months earlier after presenting diarrhea, fever, weight loss, and positive ELISA and Western Blot (WB) tests, without antiretroviral treatment. For the last ten days the patient had presented watery diarrhea, fever, asthenia, adynamia, confusion and muscular rigidity. Physical examination revealed temperature = 39.5 °C, blood pressure = 90/50 mmHg, heart rate = 120 bpm and respiratory rate = 32 bpm. The patient was diaphoretic, disoriented in time and space, very restless, with nuchal and lower extremity rigidity, also presenting oral candidiasis and hepatosplenomegaly. The laboratory results reported: hemoglobin: 9.7 g/dL, leukocytes: 2,500/mm³, neutrophils: 57%, lymphocytes: 33%, monocytes: 10%, platelets: 52,000/mm³, serum creatinine: 1.9 mg/dL, serum sodium: 129 mEq/L, serum potassium: 4 mEq/L, total protein: 6.5 g/dL, serum albumin: 1.9 g/dL. Arterial gases showed metabolic acidosis. The cytochemistry of cerebrospinal fluid (CSF) revealed a cloudy aspect, with glucose of 70 mg/dL (serum glucose: 160 mg/dL), protein 450 mg/dL and 4,750 cells (70% polymorphonuclear cells). Gram, Ziehl Nielsen and India ink stains were negative. Stool and urinalysis, chest x-ray and CAT scan were normal. The patient was treated with lactated Ringer's solutions, dopamine, midazolam, cefotaxime and intravenous ciprofloxacin, with subsequent improvement of hypotension, diarrhea and metabolic

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Address for correspondence: Dr. Francisco Espinoza-Gómez, Laboratorio de Salud Pública, Facultad de Medicina de la Universidad de Colima, Avenida Universidad 333, Colonia las Víboras, Colima, Colima, México, CP 28040. E mail: fespino@gcic.ucol.mx.

acidosis. Two negative blood cultures were reported, meanwhile *Alcaligenes xylosoxidans* subsp. *xylosoxidans*, sensitive to ciprofloxacin, was isolated from CSF (Microscan Walkaway 96®, Dade BEHRING LABS). ELISA and WB tests confirmed HIV. A CD4 count resulted in 276/dL. Treatment with lopinavir, ritonavir and tenofovir was started. Following the remission of the neurological symptoms, the patient was discharged after two weeks of treatment with ciprofloxacin and the aforementioned antiretroviral therapy.

Discussion

This report adds *Alcaligenes xylosoxidans* to the list of possible CNS infectious agents in patients with HIV/AIDS. Despite the fact that *Alcaligenes xylosoxidans* can be confused with *Pseudomonas* sp. [6], the biochemical characteristics detected by automated systems (Microscan) allow for a reliable identification [12,13]. Due to the low notification of infections caused by this bacterium, its epidemiology is not known. It is proposed that, in humans, inoculation is mainly nosocomial via contaminated catheters [5,14]. There are isolated reports of community-acquired infections, as appears to be in this case, although the primary source of inoculation is unknown. Risk factors associated with mortality due to this microorganism are: more than 65 years of age, nosocomial acquisition and neutropenia [6,15], the last one present in our patient. *A. xylosoxidans*' susceptibility pattern indicates that it requires a very specific treatment. The recommended empirical regimen consists in piperacillin, imipenem or ceftazidime. In this case, the bacteria was sensitive to ciprofloxacin, in contrast to that reported by Shie, who found that only 20-25% of strains were sensitive to quinolones [5] possibly due to the fact that the pattern of susceptibility to antibiotics can be modulated by the HIV infection [3]. The initial treatment with ciprofloxacin in this patient was directed to a possible enteritis caused by Gram-negative bacilli, and was continued after isolating the bacteria from CSF and obtaining the antibiogram. This could explain his rapid and dramatic recovery. This case emphasizes the importance of considering less frequent etiologies among CNS infections in patients with HIV/AIDS, especially bacterial infections, since they could have a better prognosis if adequately identified.

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