JACOBS PUBLISHERS

OPEN ACCESS

Jacobs Journal of AIDS/HIV

Case Report

Soft tissue Abscess due Nocardia abscessus and Cryptococcus neoformans in an HIV Infected Patient: First Case Reported and Literature Review

Corti M[1,2*], Villafañe MF[1,2], Benchetrit A[3], Messina F[2,3], Negroni R[2,3]

[1]*HIV/AIDS Division, Infectious Diseases F. J. Muñiz Hospital, Buenos Aires, Argentina.*

[2]*Medicine Department, Infectious Diseases Orientation, University of Buenos Aires, School of Medicine, Buenos Aires, Argentina.*

[3]*Mycology Unit, Infectious Diseases F. J. Muñiz Hospital, Buenos Aires, Argentina.*

**Corresponding author: Dr. Marcelo Corti, Division "B", Infectious Diseases F. J. Muñiz Hospital Puán 381 2° C 1406 CQG, Buenos Aires, Argentina, tel: 54 11 44323762; E-mail: marcelocorti@fibertel.com.ar*

Received: 01-17-2016

Accepted: 03-07-2016

Published: 03-19-2016

Abstract

Several clinical trials showed that combination antiretroviral therapy decrease the viral replication, preserve the immune system and reduce the morbidity and mortality in human immunodeficiency virus infected patients. However, in those who not receive highly active antiretroviral therapy or those individuals who do not know their personal serological status to human immunodeficiency virus infection and those who have a poor adherence to antiretroviral therapy, opportunistic infections continue to be a frequent cause of morbidity and mortality in AIDS patients.

Nocardiosis is a localized or disseminated infection occurring in both immunocompetent and immunocompromised subjects. Cryptococcosis due to *C. neoformans* is an opportunistic mycosis, especially in HIV-positive patients, which frequently involve the central nervous system. It presents high mortality and represents the second most common infection of the central nervous system in patients with AIDS. Here, we present a patient infected with the human immunodeficiency virus (HIV) who developed a soft tissue abscess due to *Nocardia abscessus* and *Cryptococcus neoformans* in the context of the immunodeficiency related with the retrovirus.

Keywords: *Nocardia abscessus*; *Cryptococcus neoformans*; Soft Tissue Abscess; HIV/AIDS

Introduction

Opportunistic infections (OIs) are important and frequent cause of morbidity and mortality in patients with AIDS, especially in those who not receive highly active antiretroviral therapy (HAART) or those that ignore their serological status to the retrovirus and finally, those who have a poor adherence to antiretroviral therapy [1]. Additionally, in some patients, OI represents the first manifestation of the immunodeficiency associated with the retrovirus.

Here, we describe the first report of concomitant infection in a soft tissue abscess due to *Nocardia abscessus* and *Cryptococcus neoformans* in an HIV infected patient.

Case Report

A 44-year-old HIV-seropositive man was admitted to the HIV/AIDS department of our hospital with headache, fever and constitutional syndrome for more than three weeks of evolution. He had diagnosis of HIV infection 20 years

ago with no clinical controls or HAART. He had no history of AIDS-defining illnesses. He referred history of inhaled cocaine and abuse of alcohol. Relevant physical examination findings included fever, headache, a poor clinical condition with pale skin and mucous membranes. A fluctuating subcutaneous abscess was detected in the left preauricular region about 3 cm x 2 cm, with redness, heat and pain, accompanied by a subangulomaxilar ipsilateral lymphadenopathy with inflammatory appearance (Figure 1).

Figure 1. Fluctuating subcutaneous abscess in the left preauricular region accompanied by a subangulomaxilar ipsilateral lymphadenopathy.

A computed tomography scan of the brain was performed, without evidence of cerebral space occupying lesion. A craniofacial CT scan of was performed without evidence osteolytic lesion. CT scan of the chest showed bilateral centrolobulillar infiltrates. The most significant laboratory findings on admission were: erythrocyte sedimentation rate > 140 mm 1º hour, hematocrit 21%, hemoglobin 6.6 g / L, white blood cells 4 400 / mm^3, platelets 90,000 / mm^3, prothrombin 68%, urea 16 mg%, creatinine 0.9 mg%, TGO 31 IU / L, TGP 20 IU / L, alkaline phosphatase 185 U / L and lactic dehydrogenase 232 U / l. The CD4 + T-cells count was 22 cells / uL (6%), and the serological status for hepatitis virus was antiHCV (+), HBsAg (-) Anti HBc (-). A lumbar puncture was performed with opening pressure of 25 cm of water. The physicochemical examination of cerebrospinal fluid (CSF) showed two cells / mm^3, normal protein concentration and mild hypoglycorrhachia (36 mg / dl). In direct examination with India ink, encapsulated yeasts was observed. High levels of antigenorachia (1/10000) and antigenemia (1/1000) were observed. Blood culture was positive for *Cryptococcus neoformans*. A fine needle aspiration of the abscess was performed obtaining abundant purulent material. It was sent to the identification of common bacteria, mycobacteria and fungi.

In the bacteriological and mycological cultures of the abscess *Cryptococcus neoformans* (Figure 2) and *Nocardia abscessus* were identified (Figure 3). The patient began treatment with amphotericin deoxycholate at a dose of 0.7 mg/kg/day, fluconazole 800 mg /day, ciprofloxacin 400 mg/day and trimethoprim/sulfamethoxazole (TMS) a double dose tablet every 12h . *Nocardia abscessus* strain isolated from this patient was sensitive to ciprofloxacin and TMS and resistant to imipenem and azithromycin. The patient presented a good clinical evolution and treatment response and was discharged after 15 days of treatment.

Figure 2. Colonies of *Cryptococcus neoformans* observed on Sabouraud agar.

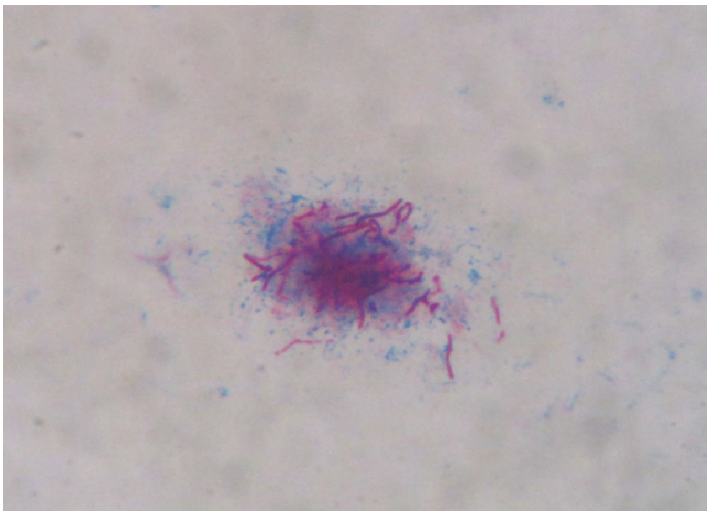

Figure 3. Nocardia abcessus colonies with Kinyoun stain.

Discussion

The Nocardia genus includes various species that are important pathogens in humans. Nocardia asteroides complex includes a heterogeneous group of microorganisms with similar and different biochemistry and genetic characteristics as well as antimicrobial susceptibility [2]. Numerous studies revealed the heterogeneity of the species Nocardia asteroids group which contains the subgroup Nocardia asteroides sensu stricto, *N. farcinica and N. nova* [3]. *Nocardia abscessus* was characterized after a polyphasic taxonomic analysis of four clinical isolates originating from various abscesses and was described by Yassin et al [4] in 2000. The authors revealed that the new strain of Nocardia exhibited a 56,8% of DNA-related to Nocardia asteroides by chemotaxonomic and 16S rRNA gen sequence analysis.

The incidence of nocardiosis in AIDS patients shows geographic variations; it occurs mainly in rural regions rather than in urban areas [2]. Patients with AIDS and CD4 T-cell counts less than 100 cell/µL are at high risk to develop disseminated nocardiosis with subcutaneous, pulmonary and central nervous system (CNS) involvement [5]. The most common sites for hematogenous spread of primary nocardial infection are the skin and subcutaneous tissues, the CNS and the joints and bones.

The clinical manifestations of infections cause by *N. abscessus* are pulmonary involvement, primary cutaneous lesions as in our patient, cerebral abscesses and disseminated infections [5,6]. The genus Nocardia included different species according with the drug susceptibility patterns. In the past few years, the importance of identifying the Nocardia species has been demonstrated, because the antimicrobial susceptibility pattern is not the same for the different species. Optimal antimicrobial regimens have not been totally established. Different Nocardia species show in vitro different antimicrobial susceptibility; in consequence, the management of Nocardia infections must be individualized for each patient [7]. *Nocardia abscessus* show generally a pattern of susceptibility that included sulfamethoxazole, ampicillin, amoxicillin-clavulanate, ceftriaxone, linezolid and amikacin with resistance to imipenem, fluoroquinolones and clarithromycin [8]. However, *N. abscessus* strain isolated in our patient revealed susceptibility to ciprofloxacin that was included in the initial antimicrobial scheme with a good clinical response. Previous studies demonstrate that trimethoprim-sulfamethoxazole had good in vitro activity against the most common clinical isolates of Nocardia species, such as *Nocardia brasiliensis*, but this activity against other Nocardia species varied [9]. In contrast, a study conducted in Spain showed that all six of the clinical isolates of *N. abscessus* analyzed were resistant to imipenem with MIC values ≥ 32 µg/ml. In the present study, we found that *N. abscessus* isolate were susceptible to trimethoprim-sulfamethoxazole and ciprofloxacin, but resistant to imipenem (MIC ≥ 32 µg/ml). Overall, no solid conclusion on the susceptibility profiles of *N. abscessus* can be drawn based on the limited number of in vitro studies [7].

Cryptococcosis is an opportunistic mycosis, especially in HIV-positive patients, which frequently involve the central nervous system. Neurocryptococcosis is a fungal illness with high mortality and represents the second most common infection of the central nervous system in patients with AIDS. The incidence of the infection caused by Cryptococcus in patients with AIDS is related to other factors beyond a low level of CD4 T-cell counts and the fungal exposure. In immunocompromised patients, particularly those with AIDS, meningoencephalitis is present in more than 90% of cases with a more acute course. Primary cutaneous infection is rare, but has been reported in several studies [10,11]. Cutaneous or subcutaneous involvement appears as a tubercle, nodule or abscess at the site of penetration and, rarely, with satellite lymphangitis and adenopathy.

Skin lesions are observed in 6% of AIDS-associated disseminated cryptococcosis and in 10% to 15% of those associated with sarcoidosis, organ transplantation or treatment with high doses of corticosteroids. The initial lesion is usually a painless papule, which softens in the center and ulcerates at the apex, sometimes acquiring an acneiform or molluscoid appearance [12,13]. In AIDS patients, this form of presentation is common and usually multiple. Subcutaneous nodules are more common in patients receiving high doses of corticosteroids, some evolve to gumma that ulcerate with sharp edges and a red surface that is covered by a gelatinous secretion. The infection rarely produces abscesses or cellulitis as we could see in our patient. This lesion pleomorphism makes the diagnosis of this fungal infection difficult. These clinical findings, which are common

in patients with different diseases, such as AIDS, lymphoma, sarcoidosis, diabetes, or organ transplant, and due to multiple microbiologic agents that cause them, should be carefully studied to establish the correct etiologic diagnosis [13].

There are two reports of concurrent infections with Nocardia species and Cryptococcus in patients receiving corticosteroids. In one case, both organisms were isolated from an open lung biopsy performed to investigate pulmonary nodules and in the other there was evidence of disseminated infection with both *C. neoformans and N. brasiliensis* [14,15].

The Meadline, Embase, Scielo, Latindex and Cochrane databases were searched to identify other cases of soft tissue abscess due to *Nocardia abscessus* and *Cryptococcus neoformans* in AIDS patients. Terms used in the search were: *Nocardia abscessus*, *Cryptococcus neoformans*, soft tissue abscess, AIDS and HIV. To the best of our knowledge, this is the first report of concomitant infection in a soft tissue abscess due to *Nocardia abscessus* and *Cryptococcus neoformans* in an HIV infected patient.

References

1. Myers SA, Kamino H. Cutaneous cryptococcosis and histoplasmosis co-infection in a patient with AIDS. J Am Acad Dermatology. 1996, 34(5 Pt 2): 898-900.

2. Corti M, Villafañe Fioti MF. Nocardiosis: A review. Int J Infect Dis. 2003, 7(4): 243-250.

3. Kageyama A, Yazawa K, Kudo T, Taniguchi H, Nishimura K et al. First isolates of *Nocardia abscessus* from humans and soil in Japan. Nippon Ishinkin Gakkai Zasshi. 2004, 45(1): 17-21.

4. Yassin AF, Rainey FA, Mendrock U, Brzezinka H, Schaal KP. *Nocardia abscessus* sp. Int J Syst Evol Microbiol. 2000, 50(4): 1487-1493.

5. Lai CC, Tsai HY, Ruan SY, Liao C, Hsueh PR. Fatal pneumonia and empyema thoracis caused by imipenem-resistant *Nocardia abscessus* in a cancer patient. J Microbiol Immunol Infect. 2015, 48(6): 706-708.

6. Cecchini D, Ambrosioni JC, Gómez A, Biscione F, Orduna T et al. Disseminated nocardiosis caused by *Nocardia abscessus* in an HIV-infected patient: first reported case. AIDS. 2005, 19(12): 1330-1331.

7. Muñoz J, Mirelis B, Aragón LM, Gutiérrez N, Sanchez F et al. Clinical and microbiological features of Nocardiosis 1997-2003. J Med Microbiol. 2007, 56(4): 545-550.

8. Wilson JW. Nocardiosis: Update and clinical overview. Mayo Clin Proc. 2012, 87(4): 403-407.

9. Lai CC, Liu WL, Ko WC, Chen YH, Tan HR et al. Multicenter study in Taiwan of the in vitro activities of nemonoxacin, tigecycline, doripenem, and other antimicrobial agents against clinical isolates of various Nocardia species. Antimicrob Agents Chemother. 2011, 55(5): 2084-2091.

10. Viviani MA, Tortorano AM. Cryptococcosis. In: Anaisse EJ, Mc Ginnis MR, Pfaller MA, editors. Clinical mycology. 2nd ed. New York: Churchill Livingstone Elsevier; 2009. 231-249.

11. Chayakulkeeree M, Perfect JR. Crytococcosis. Infect Dis Clin N Am. 2006, 20(3): 507-544.

12. Elewski B, Radentz WH, Gupta AK. Opportunistic mycoses. In: Elewski B, editor. Cutaneous fungal infections. 2nd ed. Cambridge: Blackwell Science; 1998, 225-259.

13. Negroni R. Cryptococcosis. Clin Dermatol. 2012, 30(6): 599–609.

14. Schreiner DT, de Castro P, Jorizzo JL, Solomon AR, Holder WR. Disseminated Nocardia brasiliensis infection following cryptococcal disease. Arch Dermatol. 1986, 122(10): 1186-1190.

15. Shafiq M, Schoch PE, Cunha BA, Iliescu MD. Nocardia asteroides and *Cryptococcus neoformans* lung abscess. Am J Med. 2000, 109(1): 70-71.