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RESEARCH ARTICLE

RHODOCOCCUS EQUI INFECTION IN AN INMUNOCOMPROMISED PATIENT: HOW TO TREAT?

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ABSTRACT

There are several microorganisms that can cause lung lesions in patients infected by the human immunodeficiency virus (HIV) like Mycobacterium tuberculosis, Pneumocystis carinii or Staphylococcus aureus, among others. Rhodococcusequi is an emergent microorganism associated to opportunistic infections in immunocompromised individuals, especially in patients with Acquired Immune Deficiency Syndrome (AIDS). There is not an established regimen to treat this microorganism, neither the duration of it. This report describes a case of Rhodococcusequi lung infection in a HIV patient.

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INTRODUCTION

Rhodococcusequi is an aerobic, strict and intracellular gram-positive coccobacilli, which is a frequent cause of disease in a number of animals, being the most common cause of pneumonia in foals (Cohen, 2014). There is increasing recognition that this pathogen can cause disease in humans, either immunocompetent or immunocompromised individuals. Lung chronic infection is the most common pathology caused by this microorganism, but it can also cause bacteremia, abscesses in any organ and wound infection (Kedlaya, 2001). Treatment is not well established, antibiotic choices have often included combination therapy (3). The duration and intensity of treatment should be determined by the immunologic status of the host.

METHODS

This report describes a 42-year-old male with infection with the human immunodeficiency virus type 1 (HIV-1) category C3. Currently in antiretroviral treatment (HAART) with Elvitegravir/cobicistat/Emtricitabina/Tenofovir alafenamida, with poor therapeutic adherence. Native of the Czech Republic, who has lived in Spain continuously for the last 15 years. He works as a carer of horses and drinks 40g alcohol/day.

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He went to the emergency department with progressive onset fever, up to 39°C, of one month of evolution, associating dyspnea and pleuritic features chest pain with brownish expectoration. In the complementary tests performed, the biochemical study was normal, except for C reactive protein (PCR) of 6.26mg/dl (normal up to 0.5mg/dl) and the chest radiography showed a condensing and cavitated lesion in the right upper lobe. The patient was diagnosed with cavitated pneumonia, with a score of 42 on the FINE scale. He entered in the Internal Medicine plant, in respiratory isolation. A large microbiological study was carried out and a empirical antibiotic treatment was started with Ceftriaxone 2g every 24 hours and Clindamycin 600mg every 8 hours.

RESULTS

Pneumococcal and legionella antigenuria, serology for Brucella, Toxoplasma gondii, hepatitis A, B and C viruses and syphilis resulted negative. Immunofluorescence for Pneumocystis jiroveci was negative. Thoraco-abdominal CT was performed, a lesion compatible with abscessed pneumonia was found in LSD (Figure 1). The immuno-virologic study showed: 13 CD4 lymphocytes (6%) with an HIV viral load of 113,526 copies/ml. Prophylaxis was initiated with Trimethoprim 160mg/Sulfamethoxazole 800mg three times a week. Rhodococcusequi was isolated in the sputum culture. The antimicrobial treatment was modified, directed according to the antibiogram, with Imipenem 500mg every 6 hours, Clarithromycin 500mg every 12 hours and Rifampicin 600mg a day.

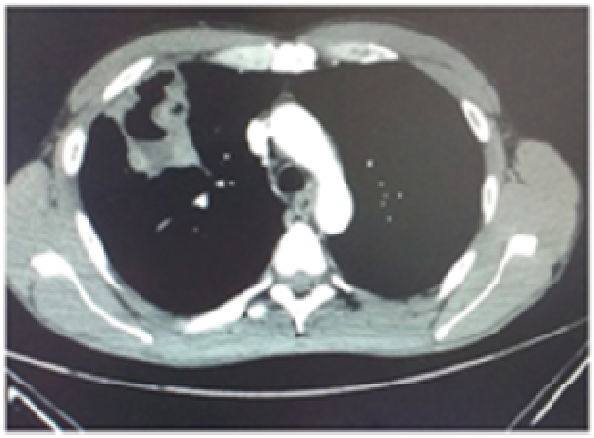

Figure 1. CT chest scan: Abscessed pneumonia in upper right lobe

After a week of antibiotic treatment, the antiretroviral treatment, that the patient had been voluntarily suspended during the previous 7 months, was reinitiated with Emtricitabine, Tenofovir disoproxil fumarate and Raltegravir. After three weeks of parenteral treatment, the patient shows significant clinical improvement, so we proceed to hospital discharge with Rifampicin and Clarithromycin. After six months of treatment, the patient presents clinical and radiological improvement.

DISCUSSION

The genus Rhodococcus is composed of several ubiquitous environmental species. These are facultative intracellular pathogens that affect innate immunity, being cellular immunodepression (HIV), transplantation, hematologic neoplasia and steroid treatment, among others, the risk factors to suffer from them. To establish a diagnostic suspicion results very important the epidemiological environment surrounding the patient, as these microorganisms are usually present in the intestine of herbivorous animals and disseminated in the environment. The main form of transmission is by exposure to soil contaminated by herbivore manure. Cavitated pneumonia in the upper lobes is the most common form of presentation in immunocompromised patients, while in immunocompetent predominates the extrapulmonary location (Weinstock, 2002). The first case in a patient with HIV infection, was reported in 1986. Since then, there has been a progressive increase in the incidence of infection within this subgroup of population, being higher among those HIV patients who have already suffered opportunistic AIDS-defining diseases (Samies *et al*., 1986).

The main affectation of Rhodococcusequi is pulmonary, followed by the presence of nonspecific constitutional syndrome (Kwa *et al*., 2001). Clinical symptoms such as fever, pleuritic pain, present an insidious course, which implies a delay in diagnosis and a worse response to antimicrobial treatment (Torres *et al*., 2003; McNeil, 1992). There are several forms of presentation at the radiographic level, interstitial, nodular or alveolar infiltrates can be observed. Cavitations occur in more than 50% of cases (Verville *et al*., 1994). The diagnosis is based on the culture of samples of affected tissue in an aerobic environment at a temperature of 37°C, which ensures high profitability.

Regarding the therapeutic attitude towards Rhodoccocusequi, there is no established regimen. The infection of any location in the immunocompetent patient, except for the central nervous system (CNS), can be treated with a macrolide and rifampin or a quinolone for at least 2 months, orally. The infection in the immunocompromised patient or the CNS infection, in any type of patient, or the severe infection, must be treated with the association of three drugs: vancomycin or carbapenem plus rifampin plus moxifloxacin or macrolide or aminoglycoside, for at least 6 months. Patients with chronic immunosuppression should maintain a chronic suppressive treatment, due to the risk of recurrence (Menon, 2012). It is not clearly defined with which drugs, although a regimen in oral monotherapy with in vitro activity against Rhodococcus could be sufficient: azithromycin or trimethoprim/sulfamethoxazole. Quinolones may also be an option. Linezolid is also active in case of allergy. Carbapenems and aminoglycosides are active in vitro, but their effectiveness in monotherapy is low due to their low cell penetration. Associations of two or more drugs should be used because they could confer a high rate of primary mutations. Regarding primary prevention in HIV patients, the most effective measure is the early initiation of HAART. In untreated HIV-infected patients the relative risk of death from R. equi infection was 53 times greater than in those who received appropriate antiretroviral therapy (Topino *et al*., 2010). A possible complication could be the syndrome of immune reconstitution (SIRS), but both, the prognosis and the clinical evolution of the patient, have been favored with the early initiation of HAART.

Conclusion

Rhodococcusequi infection is an infrequent complication in patients with AIDS, which should be suspected considering the epidemiological environment of the patient. Early diagnosis, combined and prolonged antimicrobial treatment and the initiation of HAART early, can improve the evolution and prognosis of these patients. The immunologic status of the host is the main determinant of the success of therapy.

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Conflicts of Interest

The authors declare no conflict of interest.

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