ment and is recommended as the primary choice for treatment of MG infections.[1] Dual mutations conferring resistance to both antimicrobials were found in a total of four resistant strains: two A2058G/G259A, one A2058T/G259A and one A2059G/G248T. The presence of dual mutations could increase treatment failure.[7]

The main limitation of this study was the incomplete data, like the sexual habits of the patients and the number of patients lost for follow-up and for the analysis of antibiotic failure.

In conclusion, the dissemination of resistant MG strains is a worldwide health problem and supports the importance of detecting macrolide and fluoroquinolone resistance mutations in order to perform targeted treatment and to prevent the spread of resistant strains.

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Bartonella spp. infection in a person with HIV and advanced immunosuppression: A case report

Infección por Bartonella *spp. en persona con VIH e inmunosupresión avanzada: a propósito de un caso*

People with HIV (PWH), especially advanced immunosuppression, are susceptible to *Bartonella* spp. infections and complications like hemophagocytic lymphohistiocytosis (HLH).[1] HLH mimics severe systemic infections, complicating diagnosis.[2] Early diagnosis is crucial for better prognosis and recovery. We report a case of disseminated *Bartonella* spp. infection in PWH with secondary HLH.

A 54-year-old man, born in Spain, with a one-year history of constitutional syndrome and chronic diarrhoea was diagnosed with *Cytomegalovirus* (CMV) ileocolitis, and advanced HIV infection: CD4+ lymphocyte count of 8 cells/μL, HIV-1 RNA viral load (VL) of 609,418 copies/mL, CMV VL at diagnosis of 6859 copies/mL, and intestinal biopsies showed viral inclusions.

Following admission in the ward, he started antiretroviral therapy (ART) with bictegravir/emtricitabine/tenofovir alafenamide (BIC/F/TAF) and intravenous ganciclovir. Diarrhoeal symptoms improved and CMV VL decreased. Initial computed tomography (CT) imaging at diagnosis revealed hepatosplenomegaly and mesenteric lymphadenopathy. During follow-up, he showed persistent evening fever, night sweats and general malaise. Laboratory results revealed pancytopenia, initially addressed as valganciclovir side effect, but persisting despite discontinuation. Three weeks later, he was readmitted due to worsening of pancytopenia, hepatic impairment and elevated acute phase reactants. Bacterial cultures were negative and CMV VL remained low. A PET-CT scan showed elevated metabolic activity in the spinal cord and mesenteric adenopathy, which is consistent with the presence of a lymphoproliferative syndrome (Fig. 1).

The bone marrow aspirate was hypocellular, without evidence of blasts, lymphoid infiltration, hemophagocytosis, or the presence of *Leishmania* spp. or mycobacteria. On suspicion of immune reconstitution syndrome, oral prednisone was started. Despite apparent initial improvement, he was readmitted for a third time due to persistent symptoms and no improvement in pancytopenia. A second

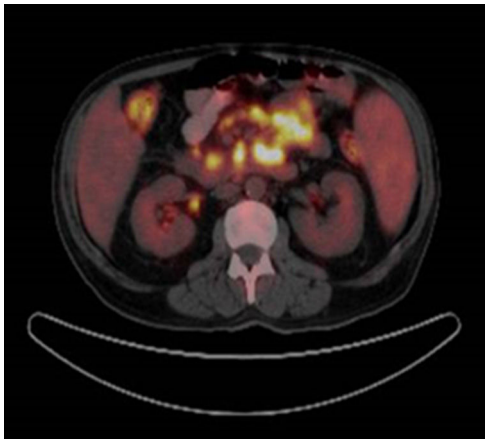

Fig. 1. Mesenteric adenopathy growth in the PET-CT.

interview with the patient revealed that he had resided in Mexico City, for a period of five years, during which time he had travelled extensively throughout the country. Repeated microbiological cultures were negative, including mycobacteria, as well as *Histoplasma capsulatum* in blood and bone marrow, expanded upon the patient's epidemiological information.

A follow-up CT scan showed increased splenomegaly and mesenteric and retroperitoneal lymphadenopathy. Hepatic angiomatoid lesions were also noted. Alternative diagnoses were considered including hemophagocytic syndrome, immune reconstitution syndrome, unmasked opportunistic infection, or lymphoproliferative syndrome.

On further questioning, the patient revealed that he had been in contact with animals, particularly cats, during his stay in Mexico. A liver biopsy was performed due to persistent mild dissociated cholestasis and increased hepatosplenomegaly. A pan-fungal PCR was requested and, due to the presence of angiomatoid lesions and as reported by the patient, a specific PCR for *Bartonella henselae* was requested with a positive result. Histopathology showed signs of hemophagocytosis. Bacillary angiomatosis due to *B. henselae* with associated HLH was diagnosed. Following treatment with doxycycline and prednisone, the patient's condition improved, requiring no additional hospitalizations.

In PWH, *B. henselae* and *Bartonella quintana* can cause severe infections. *B. henselae* typically affects cutaneous, lymph node, liver, and splenic tissues, while *B. quintana* primarily causes cutaneous, subcutaneous and bone infections.[3]

Severe *Bartonella* spp. infections occur in profoundly immunocompromised individuals, usually with CD4+ cell counts < 100 cells/μL.[4] Clinical features of bartonellosis in PWH are not always obvious and can sometimes mimic other diseases, such as immune reconstitution inflammatory syndrome (IRIS) or lymphoproliferative syndrome. The relationship between *B. henselae* and disease presentation is complex, as the severity and nature of the disease often depends on the host immune response.[5]

Nucleic acid amplification techniques (NAAT), culture, or visualisation of the organism in tissue samples are required to make an accurate and definitive diagnosis.[6] However, a definitive diagnosis is not always possible. In some cases, a cautious approach with sequential imaging and liver function tests may be preferable to biopsy.

PWH with advanced immunodeficiency may develop HLH secondary to infectious or neoplastic processes. HLH, characterised by intense immune activation, is a potentially life-threatening condition that can be familial or sporadic, often triggered by factors disrupting immune balance.[7] While bone marrow aspiration often leads to diagnosis, the HLH-2004 criteria are sufficient for diagnosis.[8] In our case, hemophagocytosis was observed in liver biopsy samples, although bone marrow samples were negative for HLH.

Secondary HLH treatment focuses on suppressing inflammation.[9] For *Bartonella* spp. infections, azithromycin, doxycycline, and gentamicin are effective.[10] Bartonellosis, although rare, can cause HLH in HIV-infected patients. Clinical suspicion of *B. henselae* is important in advanced HIV cases, especially those with animal exposure. Prompt recognition and treatment of complications, including HLH, are essential to improve outcome.

Consent for publication

Written informed consent was obtained from the patient for publication of this case and accompanying images.

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Conflicts of interest

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