

Pneumocystis Choroiditis: A Case Report and Literature Review

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Abstract

Pneumocystis choroiditis, is a rare manifestation of *Pneumocystis jirovecii* infection, that typically occurs in people that live with advanced HIV. This presentation reflects disseminated disease, often associated with *Pneumocystis* pneumonia, and is primarily diagnosed through ocular examination and imaging. We present the case of a 52-year-old woman with newly diagnosed, untreated HIV, who developed *Pneumocystis* pneumonia and choroiditis.

The patient presented respiratory symptoms and persistent tinnitus. Initial management involved trimethoprim/sulfamethoxazole, steroids were added through the evolution of the infection. Despite clinical improvement, the patient experienced sudden deterioration, culminating in cardiorespiratory arrest. This case highlights the importance of early recognition and ophthalmology evaluation in patients that live with advanced HIV and *Pneumocystis* pneumonia, as *pneumocystis* choroiditis is a marker of disseminated disease. Although the use of prophylactic treatments like pentamidine has been associated with this infection, our case underscores the occurrence of *pneumocystis* choroiditis in the absence of prior prophylaxis. Further research is needed to establish optimal management strategies and the role of steroids in such cases.

Keywords: Choroiditis •Pneumocystis •HIV• Mortality

Introduction

Choroiditis is a type of posterior uveitis caused by different etiologies, usually systemic. The range of visual symptoms is wide, from asymptomatic to be considered a vision-threatening disease. Differential diagnosis in the context of a person living with HIV includes parasite and bacterial infections. [1,2].

Pneumocystis choroiditis is an infection caused by *Pneumocystis jirovecii*, a fungus that mainly affects lungs but can infect other parts of the body such as the eye, spleen, lymph nodes, liver, intestines, bone marrow and heart. This pathogen is found worldwide and it can colonize the airway. Its natural reservoir is unknown [3].

Pneumocystis was previously thought to be a protozoan, it was reclassified thanks to molecular biology and now is known to be an ascomycetous fungus. It is a unicellular fungus that lacks ergosterol and can not be cultured. *Pneumocystis* has three morphological forms found in the lung: trophozoites, sporozoites and mature cysts., the latter is believed to be the infecting form. It is an opportunistic pathogen, studies suggest primary infection can occur but that reactivation is also seen in immunosuppressed people [4].

Previous epidemiology reported an 80% prevalence of *Pneumocystis jirovecii* in people living with advanced HIV, now prevalence is reported up to 38% in some countries thanks to the actual available antiretroviral treatments and the faster initiation of this medication.

Pneumocystis usually affects people living with advanced HIV (less than 200 or less than 14% CD4+), patients using steroids, oncologic patients, people with solid organ transplant. Other risk factors in HIV include: high viral load, oral candidiasis and previous bacterial pneumonia. When this fungus invades the eye it usually manifests as choroiditis, it may manifest

as visual disturbances or visual loss but most cases do not present symptoms. This infection is typically diagnosed through imaging and ocular examination. This condition is rare and is associated with *Pneumocystis jirovecii* disseminated disease [5-7].

Case Presentation

A 52-year-old Mexican woman with a recent positive test for HIV without treatment came to the clinic for evaluation. She denied any significant medical history.

Her symptoms began in June 2024 with non-dysenteric diarrhea that continued for up to 3 months and improved with an unspecified antibiotic regimen.

She started 2 weeks before with a generalized oppressive headache once a week, she reported an intensity of 8/10, accompanied by persistent tinnitus. She said she had a 1-week non productive cough with dyspnea on medium exertion and occasional chest pain when breathing, she denied fever or other symptoms.

On physical examination, the patient had a blood pressure of 100/70 mmHg, HR 110, RR 17, satO2 94% and 36.2°C. She had no evident neurological alterations or abnormalities in visual acuity. The oral cavity had white plaques consistent with candida, and a mobile, nontender, small cervical adenopathy. The lungs had bilateral diffuse rales. Cardiac auscultation was normal. Mild edema was evident in the lower limbs. The rest of the physical examination was normal.

The patient had an initial HIV viral load of 110,677 copies/mL and a CD4 count of 53 cells/mm³. Serologies for hepatitis B, hepatitis C, toxoplasma IgM/IgG and syphilis were negative. Chest X-ray showed bilateral diffuse infiltrates (Figure 1).



Figure 1. Chest X-ray with bilateral infiltrates in lung parenchyma

Treatment was started with oral trimethoprim/sulfamethoxazole at 20 mg/kg/day (calculated based on the trimethoprim component) divided every 8 hours, antiretrovirals were delayed. Opportunistic infections were ruled out with a negative sputum geneXpert, a negative urinary histoplasma antigen, and a negative cryptococcal serum antigen.

The patient was sent for ophthalmologic evaluation the next day. The findings of the ophthalmologic examination corresponded to *Pneumocystis jirovecii* choroiditis (Figure 2).

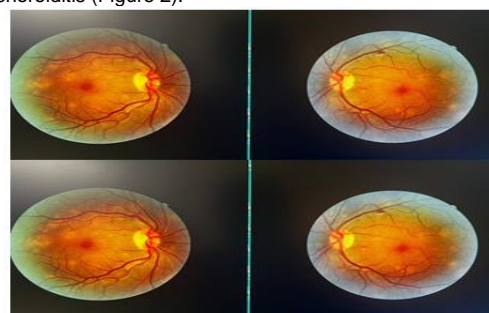


Figure 2. Retina with multiple round, white-yellow, poorly defined lesions.

The patient was visually asymptomatic. Visual acuity was 20/25 for both eyes, anterior chamber had no evidence of inflammation so as the vitreous, however multiple round, white-yellow, poorly defined lesions were found.

The patient was contacted for immediate reevaluation. She arrived at the clinic with supplemental oxygen at 5 l/min which was started by a private physician. Her saturation without oxygen was 76% and she had signs of respiratory distress. She was referred to the emergency room where noninvasive mechanical ventilation was started. Trimethoprim/sulfamethoxazole was given intravenously and she was started on steroids. A thoracic CT scan was ordered (Figure 3), the lungs presented disseminated ground glass opacities.

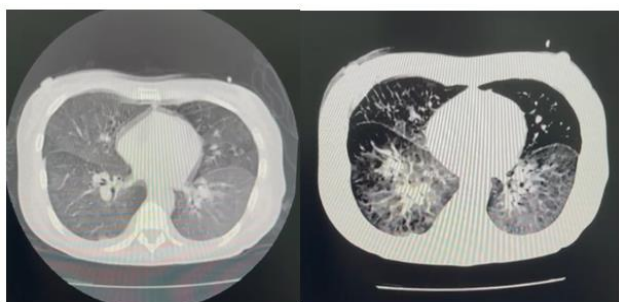


Figure 3. Thoracic CT scan with presence of bilateral ground glass infiltrates

After 7 days of treatment she showed clinical improvement and a lower oxygen requirement. Bictegravir/tenofovir alafenamide/emtricitabine was started. 48 hours later she had a sudden drop of the oxygen saturation and a cardiorespiratory arrest, return to spontaneous circulation was not achieved and the patient finally died.

Discussion

Pneumocystis choroiditis is a marker of disseminated infection usually found and previously reported in patients who had prophylactic inhaled pentamidine. The patient described in the present clinical case presented with Pneumocystis choroiditis associated with Pneumocystis pneumonia and probable disseminated pneumocystosis, but she did not have previous use of any prophylactic treatment [8].

In the pre-HAART era, the frequency of Pneumocystis choroiditis was about 1% in people with less than 200 CD4.

The use of prophylactic inhaled pentamidine was considered a risk factor for dissemination and choroiditis caused by this fungus [9].

In 1991 a 21-patient cohort with AIDS and Pneumocystis choroiditis was studied, they described choroid round, irregular and yellow to pale yellow lesions. 86% had received inhaled pentamidine, low survival was reported with a range of 2-36 weeks, and few developed visual symptoms.

Most reported cases describe an initial Pneumocystis pneumonia before the diagnosis of Pneumocystis choroiditis or the presence of visual symptoms. In a study published by B E Sha et al, they found a median of 11 CD4 in patients with pneumocystis choroiditis and reported a mortality of 37.8% associated with this clinical finding [10,11].

Gupta et al published a clinical report describing a woman with cotrimoxazole prophylaxis who developed pneumocystis choroiditis and had good outcomes after treatment [10]. Another case published by K Sabri et al reported retinal detachments in an immunosuppressed non-HIV person caused by Pneumocystis jirovecii [12]. Rugli et al described a case of conjunctival Pneumocystis jirovecii diagnosed by histology that had received 18 months of aerosolized pentamidine prophylaxis [13]. Unger et al published a case of Pneumocystis disseminated infection confirmed with histopathology that reported infiltration of the microorganisms in the arterioles [14].

Since it is a rare infection presentation there are no studies that suggest how to manage these patients, especially if initial oxygen saturation is normal. Since Pneumocystis choroiditis is a marker of disseminated disease patients should be closely monitored and/or hospitalized for management, there is no sufficient data to recognize this eye infection as a predictor of poor evolution or outcome. Use of steroids should be considered because of the burden of disease but studies are required to

determine the benefits. We should consider sending people with advanced HIV to an ophthalmology evaluation in the context of Pneumocystis pneumonia [15-17].

Conclusion

Pneumocystis choroiditis, though rare, seems to be an indirect marker of disseminated infection. Timely ophthalmological evaluation is crucial for accurate diagnosis. This case challenges previous assumptions about the association between prophylactic treatments and the occurrence of Pneumocystis choroiditis. Despite initial improvement with treatment, the sudden deterioration and subsequent cardiorespiratory arrest highlight the severity of this infection. Further research is needed to develop optimal management strategies, including the role of steroids and measures in preventing such catastrophic outcomes when Pneumocystis choroiditis is detected. These findings emphasize the need for careful monitoring and early intervention in people living with advanced HIV and Pneumocystis pneumonia.

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