"Don't jump the gun: bartonella neuroretinitis mimicking tuberculosis neuroretinitis." A Case Report and Literature Review

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Objective: To report a case of Bartonella neuroretinitis mimicking tuberculosis

Method: The authors report an unusual clinical presentation of Bartonella neuroretinitis with diagnostic challenge as its initial presentations mimicked ocular tuberculosis. A 24-year-old female presented with acute unilateral painless visual loss with prodromal high-grade fevers one month ago. Her visual acuity was 6/6 and 6/36 respectively with grade 1 relative afferent pupillary defect (RAPD). Ocular examination revealed hyperemic swollen optic disc with normal macula in the left eye. Fundus fluorescein angiography (FFA) showed presence of focal choroiditis and vasculitis in the left eye. Laboratory investigation showed a significant elevation of erythrocyte sedimentation rate (ESR) and positive tuberculin skin test (TST). It is highly suspicious of ocular tuberculosis based on the clinical findings and investigation results. Ten days later, her left vision deteriorated to 2/60, grade 3 RAPD and star-shaped pattern macular hard exudates. The patient also developed tender left cervical lymphadenopathy. The ocular findings were consistent with optic disc swelling associated with macular star from neuroretinitis. Serology titers for Bartonella IgG had resulted in 1:513. The patient regained normal vision and optic nerve function after 6-week course of oral doxycycline.

Conclusion: In conclusion, a detailed history, clinical acumen, and laboratory investigations are crucial in making an accurate diagnosis prior to commencement of treatment.

Keywords: Bartonella, neuroretinitis, tuberculosis

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Introduction

Neuroretinitis is an inflammation of the optic nerve vasculature with exudation of fluid into the peripapillary retina and is characterized clinically by optic disc oedema and a macula star pattern. The etiology may be idiopathic, infectious or non-infectious. Bartonella infections, otherwise known as cat scratch disease (CSD), as well as tuberculosis (TB), syphilis, toxoplasmosis and leptospirosis are the most common infectious agents while sarcoidosis and autoimmune diseases are among possible non-infectious causes.[1] However, it is often difficult to clinically distinguish the etiologies of neuroretinitis particularly in patients with nonspecific clinical manifestations.

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Our case was initially treated as tuberculous neuroretinitis based on the clinical appearances, ocular and systemic investigations that mimicked a tuberculosis infection but was later found to be an unusual presentation of Bartonella neuroretinitis.

Case Report

A 24-year-old female college student presented with painless blurring of vision in the left eye for oneday. There was no pain during eye movement. She had close contact at home with cats. She gave a history of high-grade fevers intermittently for the preceding one month without any neurological deficits, headaches, vomiting, joint pains, cough, rashes or enlarged glands. The fever had responded to antibiotics given by a medical practitioner.

On presentation, the right and left visual acuity was 6/6 and 6/36 respectively, with grade 1 relative afferent pupillary defect (RAPD). There was left optic nerve dysfunction as evidenced by dyschromatopsia on a D15 color vision test. Her visual field testing showed nonspecific changes as she was not cooperative during the test. Anterior segment examination of the left eye was normal although the posterior segment showed a swollen hyperemic disc with a normal macula. Right eye and systemic examinations were unremarkable.

Investigations showed a normal white count with an elevated erythrocyte sedimentation rate (ESR) of 68 mm/hour and a positive tuberculin skin test (TST) of 20 mm. Sputum acid-fast bacilli, syphilis, HIV serology, chest radiography and computed tomography of the brain were normal. OCT (Optical coherence tomography) done of the macula showed the presence of Subretinal and Intraretinal fluid in the left eye. Fundus fluorescein angiography (FFA) showed the presence of two spots of choroiditis along the superotemporal arcade with vascular leakage suggestive of an area of focal vasculitis in the left eye (Figure 1). Since the clinical picture and investigations highly suggested ocular tuberculosis infection, the patient was counseled for interferon gamma release assay test to rule out the possibility of false positive TST or trial of anti-tuberculous treatment which she refused.

Within ten days her left eye vision deteriorated to 2/60 with a grade 3 RAPD. Fundus examination showed the presence of macula edema with hard exudates distributed in a star-shaped configuration. The two choroidal lesions along the superotemporal arcade in the left eye were now more apparent (Figure 2). Along with the fundus findings, she also had tender cervical lymphadenopathy on the left side of her neck, which was a new finding.

Further tests for infectious causes were carried out. These included Bartonella and toxoplasma serology, and TB Interferon-gamma release (TB Quantiferon Gold test) assays. TB Quantiferon and toxoplasma serology were negative but the Bartonella serology was positive with an IgG titer of 1:513 (<1:64 Negative, 1:64-1:128 Equivocal, ≥1:256 Positive) and an IgM titer of 1:98 (< 1:16 Negative, ≥ 1:16 Positive). Based on this positive Bartonella serology, the diagnosis was revised, and she was treated with oral doxycycline 100 mg twice a day for the Bartonella infection.

She responded well to the treatment in which she regained 6/6 vision bilaterally with normal optic nerve function after 2 weeks of oral doxycycline. Oral doxycycline was then tapered off to 100 mg once a day for four weeks and the choroidal lesions, along with the left disc swelling, also resolved.

Discussion

This is an interesting case where a suspicious presentation of ocular tuberculosis

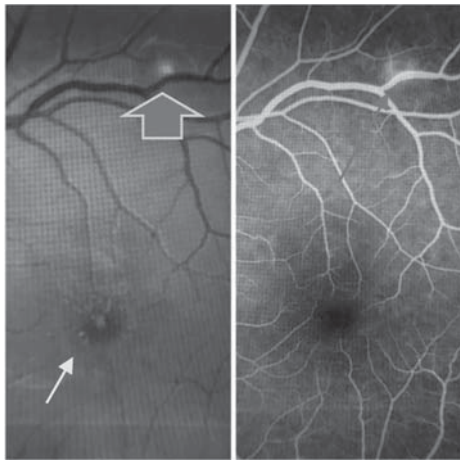

Figure 1: Fundus fluorescein angiography of left eye showing macula star (Yellow Arrow), focal choroidal lesion (Blue Thick Arrow) and focal vasculitis. (Red Arrow)

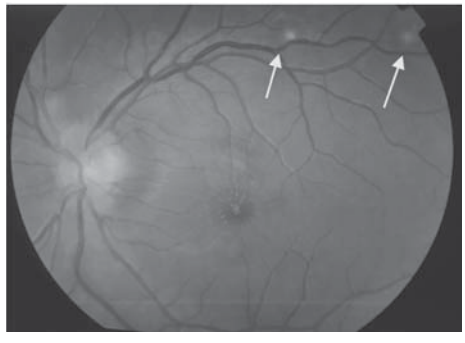

Figure 2: Left eye fundus showing disc swelling, macula star (Blue Arrow) and focal choroidal lesions. (Yellow Arrows)

turned out to be Bartonella neuroretinitis. A high index of suspicion when looking at the clinical picture and initial laboratory results almost led to the misdiagnosis of tuberculosis in this patient.

ESR is a nonspecific test that indicates the presence of an inflammation in the body and is usually raised in cases of neuroretinitis. TST is a sensitive but non-specific test where a positive result does not necessarily mean that a person has an active tuberculosis infection. A false-positive test, as high as 42% may result in individuals with previous infections, past Bacillus Calmette–Guérin (BCG) vaccination, infection with non-tuberculous mycobacteria or even hypersensitivity to the Purified Protein Derivative (PPD) used in this test.[2] In Malaysia the BCG vaccine is given to all individuals as part of the national vaccination program and this could contribute to the false positive in this case. Previously Bartonella infections were tested by performing an intradermal skin injection of Bartonella antigens. The delayed type of hypersensitivity response is similar to that seen in Tuberculosis. This could also lead to a false positive skin test result. Cervical lymphadenopathy can also be a manifestation

of Parinaud Oculoglandular Syndrome (POGS), commonly caused by Bartonella henselae and not specific to TB infection. However, in POGS, unilateral follicular conjunctivitis often precedes regional lymphadenopathy and fever by a week, which was not present in this patient.[3]

The most common cause of neuroretinitis is Bartonella henselae, the causative organism of CSD. It is usually unilateral but asymmetrical bilateral cases have been reported, especially if due to an infectious cause. In early presentation, optic disc swelling is the most evident finding. This is followed by macular star formation 1 to 2 weeks later when the disc edema begins to decrease. Isolated foci of retinitis or choroiditis, vasculitis and branch retinal artery occlusions are other possible posterior segment manifestations of ocular bartonellosis.[4, 8] A review of literature showed that small foci of retinal white lesions, focal retinitis or retinochoroiditis to be the most common ocular finding of a Bartonella infection.[6, 7, 8, 9] The second most common ocular finding is neuroretinitis.[7] Discrete retinal or choroidal lesions has also been reported as the primary ocular presentation of CSD.[9] In this patient, the presence of left choroiditis and vasculitis were erroneously thought to be due to TB and not a Bartonella infection.

The diagnosis of CSD is based on a history of contact with cats, clinical findings and positive serology. Acute infection is suggested by a positive IgM titer of 1:16 or greater, whereas an IgG titer of more than 1:256 confirms current or past Bartonella infection. A positive serology with negative TB Quantiferon further supports the diagnosis of Bartonella here.

As the clinical presentations of these two diseases can be very similar, a diagnostic dilemma arises as the treatment options significantly differ. A favorable visual outcome is anticipated with the proper treatment, although a high degree of spontaneous visual recovery exists in cases of Bartonella neuroretinitis. Antibiotic treatment is recommended in cases of severe ocular involvement or when dealing with systemic complications of CSD. The combination of antibiotics with corticosteroid treatment results in better visual outcome especially in cases with severe ocular inflammation or vision-threatening ocular involvement.[5] In this case; oral corticosteroids were not started due to high initial suspicion of TB and the resolution of symptoms after doxycycline therapy.

Conclusion

In conclusion, a detailed history, clinical acumen, and laboratory investigations are crucial in making an accurate diagnosis prior to commencement of treatment.

Conflicts of Interest

The authors report no conflicts of interest.

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