

Ocular leptospirosis in four patients: A diagnostic dilemma

Hui Ruan Ng, MBBS^{1,2}, Moon Yee Cheong, MS (Ophthalmology)¹, Mushawiahti Mustapha, MS (Ophthalmology)²

¹Department of Ophthalmology, Hospital Raja Permaisuri Bainun, Jalan Hospital, 30250 Ipoh, Perak, ²Department of Ophthalmology, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur

SUMMARY

Leptospirosis is a zoonotic disease that is caused by the pathogenic spirochetes of the genus *Leptospira*. The infection occurs worldwide and is particularly more common in the tropics. However, it is becoming a neglected re-emerging global health disease due to rapid urbanisation. This disease has a wide range of clinical manifestations from flu-like illness to pneumonia, acute kidney injury, etc. But many uncommon clinical findings are being reported as well. In this paper, we report four patients who presented initially with uveitic features who turned out serologically positive for *Leptospira* after extensive investigations.

INTRODUCTION

Leptospirosis is a zoonotic disease that is caused by the pathogenic spirochetes of the genus *Leptospira*.^{1,2} Human infection with *Leptospira* occurs worldwide, and is particularly frequent in tropical areas where the climate is warm and humid.³ The main animal reservoirs are rodents, livestock and dogs.³ The disease can be transmitted to humans by direct or indirect contact with the urine of an infected animal through cuts or abraded skin, mucous membranes of mouth, ear, nose, or conjunctivae.¹ The clinical course of leptospirosis is an acute biphasic febrile illness with or without jaundice.⁴ In the acute leptospiraemic febrile phase, clinical features such as fever, chills, rigors, arthralgia, myalgia, pharyngitis, cough, headache, conjunctival suffusion and non-pruritic rash may be present.⁵ The severity of illness varies from asymptomatic presentation to mild, moderate or severe. However, only a minor percentage are symptomatic therefore making the disease not adequately characteristic for an early diagnosis.⁴ Resolution of the febrile phase occurs after four to seven days of the initial bacteraemia with rapid clearance of *Leptospira* from bloodstream by the immune system from all host tissues except immunologically privileged organs like the brain and eyes.⁴ This results in immunological diseases like uveitis, which may be evident after two days and up to four years after the initial systemic febrile phase.⁴ In this article, we report four patients who presented initially with uveitic features who turned out serologically positive for *Leptospira* after extensive investigations. The patients were all seen at the ophthalmology department of Hospital Raja Permaisuri Bainun, Ipoh.

CASE REPORT

Case 1

A 12-year-old boy presented with a week history of right eye redness with mild blurring of vision. He was systemically well

previously. He gave a history of rodent infestations at home. Visual acuity was 6/9 over both eyes. Examination of the right eye revealed injected conjunctiva with streak of hypopyon with anterior chamber cells of four plus. Fundus examination was normal with no vitritis or retinitis. The left eye was normal. A working diagnosis of severe non-granulomatous anterior uveitis of the right eye was given. Steroid challenge with topical corticosteroids to the affected eye was administered and patient responded well. A series of investigations were done to look for the cause; which include infective and inflammatory factors (Table I). Serum for *Leptospira* Immunoglobulin M (IgM) antibody via latex agglutination was positive and further sent for microagglutination test (MAT) which showed a significant dilution at 1:400. The patient was treated with oral doxycycline 100 milligram (mg) twice daily for 14 days, topical cycloplegics and corticosteroids. The uveitis resolved and visual acuity returned to 6/6 at three weeks follow up.

Case 2

A 34-year-old gentleman complained of one week history of right blurring of vision. He was systemically well prior to the ocular complaint. He had a pet cat but denied rodent infestations at home. Right eye visual acuity was 1/60 while the left eye was 6/9. Relative afferent pupillary defect was present over the right eye. Examination of the right eye revealed mildly injected conjunctiva, anterior chamber cells of three plus, and anterior vitreous cells of two plus. Posterior segment examination revealed presence of vitritis, snow banking inferiorly, inferior blurred disc margin, retinitis and choroiditis at posterior pole with surrounding macula oedema (Figure 1a, 1b). The fellow eye examination was normal. Patient was investigated for causes of panuveitis with high suspicion of ocular toxoplasmosis due to having a pet cat (Table I). He was empirically treated with oral bactrim 960 mg twice daily, topical cycloplegics and corticosteroids while awaiting blood results. His blood results revealed positive *Toxoplasma* IgG and *Leptospira* IgM. MAT for *Leptospira* revealed a significant dilution of 1:400. Oral doxycycline 100 mg twice daily for two weeks and oral steroid 0.5 mg/kg/day in tapering fashion for six weeks were commenced. At six weeks' follow-up, there was resolution of panuveitis however the right visual acuity only improved to 6/60 due to central macula scar (Figure 1c, 1d).

Case 3

A 12-year-old boy was referred from the primary care centre for non-resolving right eye redness. He was systemically well prior to presentation. He has a pet cat at home with household rodent infestations. His visual acuity was 6/9 over

This article was accepted: 17 June 2021

Corresponding Author: Hui Ruan Ng

Email: huiruan.ng@gmail.com

MAT which uses a battery of antigens taken from common (frequently locally endemic) *Leptospira* serovars.^{3,5} MAT titre of ≥ 400 in single sample, or a four-fold rise in paired samples (between acute and convalescent period) are considered positive for MAT.⁵

Antimicrobial therapy is indicated for severe leptospirosis, but its usage is controversial for mild leptospirosis.⁵ The majority of leptospirosis infections are self-limiting in the absence of antimicrobials. Antimicrobial therapy shortens the duration of illness and reduces shedding of the organism.⁵ Doxycycline, ampicillin, or amoxicillin has been regarded as the treatment for mild to moderate leptospirosis.³ For severe leptospirosis, treatment of choice include intravenous penicillin G or third-generation cephalosporins such as cefotaxime and ceftriaxone.^{1,3,5} As for immune-related ocular complications such as uveitis, corticosteroids are the basis of treatment.⁴ Corticosteroids may be administered in the form of topical, periocular, or systemic and is supplemented by topical cycloplegics.⁴

The diagnosis of leptospirosis may be missed due to its non-characteristic clinical presentation in majority of cases. However, as leptospirosis is a disease of the tropics, it is important this diagnosis be considered in patients presenting with uveitis from this region.

ACKNOWLEDGEMENT

The authors would like to thank the Director General of Health Malaysia for the permission to publish this case report.

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