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Medical Science

BARTONELLA HENSELAE NEURORETINITIS AND VENOUS SINUS THROMBOSIS: A CASE REPORT

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ABSTRACT A 19-year-old immunocompetent male presented with severe headache and blurred vision in his left eye. Ophthalmic examination revealed reduced visual acuity and relative afferent pupillary defect in the left eye, increased intraocular pressure bilaterally, and bilateral neuroretinitis. Serology results revealed positive immunoglobulin G titres of *Bartonella henselae* (cat scratch disease). Magnetic resonance imaging of the head showed venous sinus thrombosis. The patient's bilateral neuroretinitis and venous sinus thrombosis is postulated to be caused by *Bartonella henselae*. This is the first known case demonstrating venous sinus thrombosis caused by *Bartonella henselae*.

KEYWORDS :

Initial case presentation

A 19-year-old male concrete worker presented to the emergency department of a regional hospital in Queensland, Australia, with a one-month history of throbbing frontal headache worse in the supine position, and two weeks of blurred vision in the left eye. There was no history of trauma. He complained of nausea and photophobia, but not of other neurological symptoms such as paralysis, weakness, gait changes, or bowel and urinary disturbances. The patient did not have any significant past medical or surgical history, was not taking any regular medication, and vaccinations were up-to-date. There was no significant family history. He did not smoke or take recreational drugs, but drank alcohol occasionally. He owned a 10-year-old cat, but did not recall being bitten or scratched. He had not travelled overseas, however went camping in Central Queensland three weeks before the onset of headache.

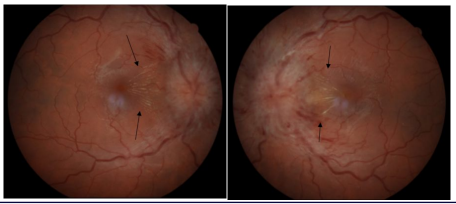
Examination revealed an overweight man (BMI 29.3) who was oriented in time, person and place. Vital signs were normal, and he was afebrile. General examination was unremarkable and no neck stiffness, rash or lymphadenopathy was seen. Ocular examination findings are outlined in Table 1. Fundoscopy examination showed bilateral macular stars and grossly swollen discs which was consistent with bilateral neuroretinitis (Figure 1). Examination showed other cranial nerves to be normal.

Table 1: Ocular examination findings

	Right eye	Left eye
Visual acuity	6/6	6/9
Pupil	Normal	RAPD
Ishihara test	15/15	10/15
Brightness	95%	60%
Red	95%	50%
ROM	Normal	Normal
Intraocular pressure (IOP)	19mmHg	23mmHg

Figure 1: Left and right eye fundus photograph

Fundus photographs show bilateral optic disc oedema and macular star formation which is suggestive of neuroretinitis.



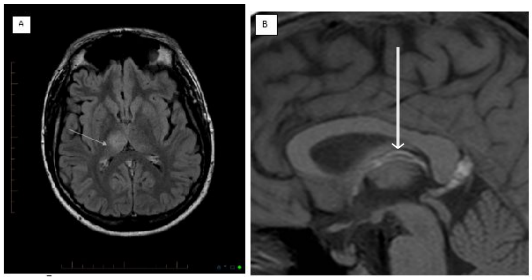
Investigations

Computed tomography (CT) brain was unremarkable. Magnetic resonance imaging (MRI) brain was difficult to interpret (Figure 2). Initially, the MRI was thought to show an intracerebral bacillary angiomatosis, or an arteriovenous malformation (AVM). However, subsequent neuroradiology opinion confirmed a venous sinus thrombosis. MRI also showed mildly elevated cerebrospinal fluid (CSF) space involving bilateral optic nerves with minimal bulge of the optic discs.

Initial lumbar puncture (LP) revealed high intracranial pressure (ICP) of over 34mmHg, however his serum protein (200mg/L) was normal. Screening for prothrombotic conditions was negative. Immunology was negative for demyelinating conditions such as multiple sclerosis, and negative for systemic lupus erythematosus and Bechet's disease. Tests for infection with Lyme disease, toxoplasmosis, and syphilis were also negative. However, the patient had positive immunoglobulin G (IgG) antibody titres of 64 for *Bartonella henselae* (BH). Cerebrospinal fluid (CSF) microbiology showed normal protein and glucose, and the test for *Bartonella henselae* DNA in the CSF was negative.

Figure 2: MRI brain

(A) is an axial view showing a venous congestion haemorrhage in the thalamus. (B) is a lateral view illustrating venous sinus thrombosis.



Treatment

The patient is being anticoagulated, and will continue treatment for approximately six months. The patient is also being treated with doxycycline and rifampicin for a total duration of six weeks, as advised by infectious diseases specialist consultation.

Therapeutic LPs were performed to reduce the severity of headache due to elevated ICP. Twenty millilitres of CSF were removed on three occasions.

Discussion

BH is an aerobic, oxidase-negative gram-negative bacillus which is typically carried in the blood of kittens. Other animals which can harbour BH include cows, dogs, foxes, horses, kangaroos, sheep, and bats.[1] Moreover, cat fleas (*Ctenocephalides felis*), ticks and spiders can act as vectors for transmission.[2] One to three weeks after inoculation, BH usually causes systemic signs and symptoms such as localized erythematous papule (where a cat has bitten or scratched), lymphadenopathy, fever, myalgia, fatigue, malaise and, anorexia.[3] The disease will resolve after one month without treatment[4] in approximately 85-95 percent of individuals.[5] More severe manifestations of BH occur in immunocompromised states such as HIV and include endocarditis, peliosis hepatis and encephalitis.[6]

The clinical diagnosis of neurobartonellosis is confirmed by the detection of IgG antibodies in the serum or by detection of BH DNA in CSF or tissue biopsy.[7] While this patient had high IgG titres, the CSF was negative for BH. It is important to note that CSF findings for bartonellosis are often normal or minimally abnormal in immunocompetent individuals, and there have been biopsy-proven cases of BH where CSF is negative.[8] This can be explained by CSF samples having a low level of bacteria, and that the CSF PCR was performed after antibiotic therapy was commenced. Thus, PCR is used to complement serology and may not be positive in all patients infected with BH.[9]

Ocular manifestations of this infection are widely variable,[10] and neuroretinitis is a typical presentation of the disease, and has been described in several case reports.[1] Neuroretinitis is suggested by sudden and painless visual disturbance in one eye, however this is a classic picture rather than pathognomonic.[11] Neuroretinitis is highly suggested by macular stars.[12] Ocular BH usually resolves satisfactorily.[13]

Thrombus formation caused by BH infection has been described involving the retinal artery.[11] Venous sinus thrombosis has been described with various infections including scrub typhus, *Cryptococcus* and herpes zoster.[14] However, there have not been any recorded cases of venous sinus thrombosis caused by BH. The mechanism behind this is not clear, however, could be due to direct invasion of the pathogen in to the venous wall or due to BH causing an acute hypercoagulable state. Furthermore, there have been some reported cases of high ICP caused by BH.[15]

Conclusion

This case covers a rare presentation of BH with neuroretinitis, venous sinus thrombosis and increased ICP in an immunocompetent young male. Neuroretinitis is a typical presentation of BH, however venous sinus thrombosis is not. Serology results, ophthalmological and neuroradiological review clarified the diagnosis. Positive PCR in CSF would have helped to confirm the diagnosis and can be explained by antibiotic therapy given before the PCR test was performed. Thus, it is suggested that BH has caused both the neuroretinitis and the venous sinus thrombosis. This case extends and gives insight into the pleomorphic clinical presentation of BH.

Conflict of interest statement

We declare that we have no conflict of interest.

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