Neuro-syphilis, HIV infection and brainstem infarction

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Learning Point for Clinicians

Early meningo-vascular neuro-syphilis must be considered as a differential diagnosis in acute stroke patients with a prodromal clinical course including suspicious skin rashes on the palms and soles, headache and intermittent low-grade fever. Co-infection with human immunodeficiency virus (HIV) can alter the clinical features of neuro-syphilis.

Case report

A 22-year-old man with a 1-year history of hypertension and poor medical compliance presented at the emergency department with left-sided numbness on the face and body for 3 days. One month prior, he had skin rashes on the palms and soles that spontaneously resolved. Intermittent low-grade fever and new-onset headache without neck stiffness were noted 1 week prior to consult. His family history was unremarkable and he denied having sexually transmitted diseases or using illicit drugs.

On physical examination, the patient was alert and afebrile. His vital signs were within normal limits. Some faded rashes on the soles were noted (Figure 1a). Aside from the impaired fine touch sensation on the left side of the face and body, the rest of the neurologic examination was unremarkable. On admission, laboratory test and unenhanced computed tomography of the brain were unremarkable.

Cranial magnetic resonance imaging revealed an acute ischemic lesion in the right pons (Figure 1b and c). Magnetic resonance angiography disclosed no segmental narrowing in the circle of Willis. Acute right pontine infarction was confirmed and aspirin was prescribed.

Cerebrospinal fluid (CSF) analysis revealed lymphocytic pleocytosis (54 white blood cells per microlitre with 100% lymphocytes), increased protein (65 mg/dl) and positive Venereal Disease Research laboratory (VDRL) test (1:1). Studies for young stroke showed positive rapid plasma reagin (RPR) (1:32), positive treponema pallidum haemagglutination (>1:1280), positive anti-HIV antibody and confirmed with western blot. The patient was treated with penicillin G 4 million units intravenously every 4 h for 14 days. He was not started on highly active anti-retroviral therapy (HAART) because his cluster of differentiation 4 (CD4) count was 598 cells/mm³ and HIV-1 RNA viral load was 51 300 copies/ml. He declined repeated lumbar puncture. On follow-up after 6 months, he was asymptomatic and his serum RPR titre was 1:2.

Neuro-syphilis is defined as syphilitic infection involving the central nervous system and is often divided into meningeal, meningo-vascular and parenchymatous forms. It can occur early as asymptomatic or syphilitic meningitis, or late as meningo-vascular syphilis, general paresis or tabes dorsalis.
Meningo-vascular syphilis occurs in 0.3–2.4% of patients with syphilis.\(^1\) Latency is usually 7 years but may be shortened to within a few months of infection in HIV patients.\(^2\) Antibiotics have increased the incidence of meningo-vascular syphilis but decreased that of parenchymatous forms.\(^3\)

Meningo-vascular syphilis can cause Heubner’s and Nissl’s arteritis, and lead to infarction of the anterior circulation more than the posterior circulation. Neuro-syphilis usually has prodromal symptoms such as headache, vertigo, insomnia and personality change before the acute infarction.\(^3\) Diagnosis of neuro-syphilis is based on reactive serologic tests, with elevated CSF protein or cell count, or positive VDRL test. Testing for HIV should also be made because neuro-syphilis is the sentinel presentation of HIV in nearly 25% of patients.\(^4\) However, at the emergency department, the misdiagnosis rate of neuro-syphilitic ischemic stroke is as high as 80.95\%.\(^5\)

Meningo-vascular syphilis is a treatable disease by appropriate antibiotics, usually with penicillin intravenously every 4 h for 14–21 days. Anti-platelet therapy is recommended due to endothelial cell proliferation from Nissl’s endarteritis.\(^6\) HAART is reserved for patients with CD4 count below 350 cells/mm\(^3\) and HIV-1 RNA viral load above 10\(^5\) copies/ml. The CSF cell count is the best indicator of treatment response. Lumbar puncture every 6 months until normalization of CSF analysis is recommended.

Early diagnosis and treatment of neuro-syphilitic ischemic stroke are crucial because neuro-syphilis is easy to treat. There is a need to consider neurosyphilis and HIV co-infection in young patients with stroke-like symptoms, especially if there are suspicious skin rashes on the palms and soles, and prodromal symptoms such as headache before the acute stroke.

**Conflict of interest:** None declared.

**References**