Neurosyphilis(Ocular Syphilis) with Bilateral Temporal Lobe Atrophy in an HIV Patient: A Case Report

Vaughn Caesar L. Edulan, M.D.*; Jeremyjones Robles, M.D.*; Carmela Remotigue, M.D.*

Abstract

Introduction: Before the advent of antibiotics, syphilis was known to be one of the most common infections affecting approximately 10% of the adult population worldwide. One of its devastating complications is neurosyphilis, which has a broad set of manifestations. Some patients may present with blurring of vision in the setting of an ongoing syphilis infection known as ocular syphilis. In the advent of increasing incidence of human immunodeficiency virus (HIV) infection, co-infection with it may further obscure its manifestations or may even cause synergistic effects.

Case Presentation: Presenting a case of a 26-year-old male patient who complained of bilateral fronto-occipital headache with progressive blurring of vision and scaly reddish to brown maculopapular lesions affecting the limbs prominently the soles and palms. CT scan showed cerebral atrophy prominently on the temporal lobe bilaterally. Mental status exam was normal. Neurosyphilis was confirmed by CSF studies and patient tested positive for HIV infection. Patient was then started on aqueous crystalline benzathine penicillin G four million units every four hours for ten days and was discharged with improved condition and no neurocognitive deficits. . He was advised to have CD4 count and other work up for his HIV infection as outpatient.

Conclusion: The reported incidence of neurosyphilis is increasing in the advent of HIV infection. The deficiency of a clear epidemiology, pathophysiology and complications of cerebral atrophy in neurosyphilis patients co-infected with HIV necessitates further studies to elucidate the proper approach to this preventable and treatable disease.

Keywords: syphilis; neurosyphilis; ocular syphilis; cerebral brain atrophy

Introduction

The incidence of syphilis and its complications such as neurosyphilis has declined markedly since the introduction of penicillin therapy. However, after the appearance of acquired immunodeficiency syndrome (AIDS) in 1981, it has increased in number due to the rising incidence of human immunodeficiency virus (HIV) and the sexual habits of individuals. High risk individuals include those men having sex with men, intravenous drug users and commercial sex workers.

Syphilis is a sexually acquired infection, which is characterized by episodes of active clinical disease interrupted by periods of latent infection if left untreated. Studies suggest that HIV infection modulates the clinical presentation of syphilis with greater organ involvement, atypical and florid skin rashes, and more rapid progression to neurosyphilis. The results of serologic tests for syphilis may also be modified in HIV-infected patients. Furthermore, emerging data suggest that syphilis may have a negative impact on HIV viral load.[1]

*Department of Internal Medicine, Cebu Velez General Hospital, Cebu City, Philippines

Corresponding author: Vaughn Caesar L. Edulan, M.D., Cebu Velez General Hospital, Cebu City, Philippines
Email:vaughncaesaredulan@gmail.com

Recently, early neurosyphilis is more common than late neurosyphilis, and is most frequently seen in patients with HIV infection. This association may simply reflect the fact that syphilis is most common in men who have sex with men, many of whom are HIV-infected, or it may reflect a true difference in vulnerability[1,2]

Neuroimaging findings of neurosyphilis include cortical and subcortical infarcts, cortical atrophy, hydrocephalus, leptomeningeal enhancement associated with clinical meningitis and arteritis. However, only few case reports have presented with mesiotemporal abnormalities.[3] In HIV, neuroimaging findings include cortical and subcortical atrophy most common on the frontal and temporal lobes. Early stage of HIV most commonly affect the frontal lobe and later affects the other lobes of the brain.[4]

Case Presentation

This is a case of a 26-year-old male who presented with bilateral frontal and occipital headache, two out of 10 in pain scale, occurring approximately twice per week for five months now. In the succeeding months, he complained of progressive blurring of vision on the left eye which progressed to the right. He sought consult from an ophthalmologist and was prescribed with steroids of unrecalled dose.

Patient was newly diagnosed with HIV after one month of recurrent headache. Patient has no known comorbidities. He is an intravenous drug user at the age of 16 and has a history of one male and five female sexual partners with first sexual contact at the age of 17. He has no previous hospitalizations, surgeries or blood transfusion.

On physical examination, vital signs were stable. Pertinent findings included non-blanching, scaly, non-pruritic, maculopapular lesions on the extremities and a healed ulcer over the penile shaft with bilateral inguinal lymphadenopathy. Patient had unremarkable central nervous system findings.

On admission, CT scan of the brain plain was done which showed mild cerebral volume loss, more pronounced in both temporal lobes. There were no signs of increased intracranial pressure (ICP). Lumbar puncture was done with cerebrospinal fluid studies showing lymphocytic pleocytosis, increased protein and decreased glucose. CSF IgG was elevated and treponema pallidum immunofluorescence was positive all consistent with neurosyphilis. Patient was started with penicillin G, four million units, every four hours for 10 days and was discharged improved.

Discussion

Neurosyphilis is the invasion of the central nervous system by treponema pallidum which is observed in five to 10% of untreated patients and may occur at any stage of the disease. Neurosyphilis can be classified into early forms and late forms. The early forms typically affect the cerebrospinal fluid (CSF), meninges, and vasculature, while the late forms affect the brain and spinal cord parenchyma. The duration of infection is important for it denotes the degree of reversibility of damage done to the brain. The diagnosis of the early stage of syphilitic infection is complex as many patients present either with nonspecific symptoms or are asymptomatic. According to a study by Bordon et al. 1995, incidence of neurosyphilis co-infected with HIV increased to 23.5% from 10% in HIV negative patients.

In patients with early neurosyphilis, they may present asymptomatically or may have evidence of concomitant primary or secondary syphilis. Ocular syphilis is one of its manifestations presenting in one third of patients with neurosyphilis with blurring of vision as its most common symptom. This can involve almost any eye structure such as the anterior uvea, and posterior uvea or both uvea, but posterior uveitis is the most common and presents with diminished visual acuity.[5,6] In patients co-infected with HIV infection, studies show that they have severe and diffuse form of inflammation such as panuveitis and has a faster course of blurring of vision such as with this patient. It is indicated therefore to test for ocular syphilis and neurosyphilis for patients with syphilis having

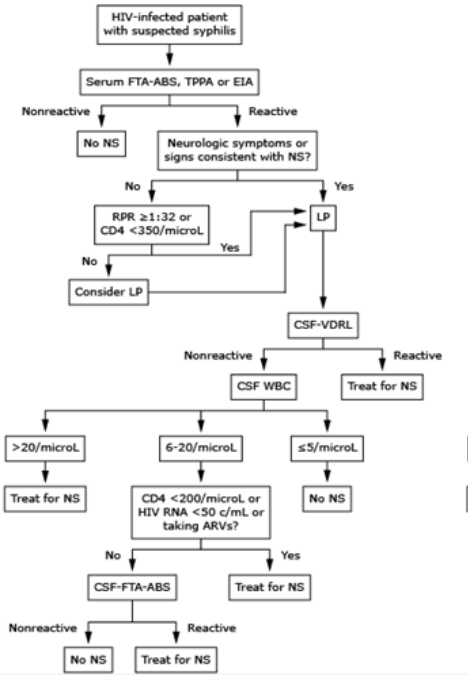

Figure 3. Algorithm for the diagnosis of Neurosyphilis coinfected with HIV 11

eye symptoms. However, its incidence in South-East Asia is inconsistent on other countries such as Singapore and Japan have several cases unlike in South China wherein it occurs rarely even with high incidence of syphilis.[7] Currently, there are no studies regarding its prevalence in the Philippines.

After 10-30 years of infection, the patient can manifest a condition known as general paresis which is characterized initially with forgetfulness and personality change. Most affected individuals experience progression of deficits in memory and judgment leading to severe dementia. Less often, patients may develop psychiatric symptoms such as depression, mania, or psychosis. These patients have also been found to have cerebral atrophy or the cortical thinning of the temporal and fronto-parietal regions bilaterally, most prominent in the temporal regions.[4]

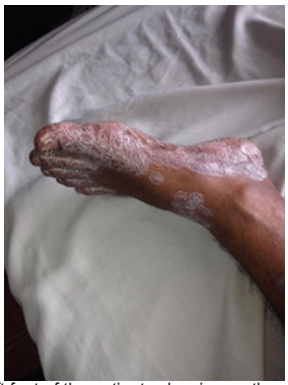

Figure 1. Left foot of the patients showing erythematous, exfoliating maculopapular rash

Human immunodeficiency virus (HIV) infected individuals develop AIDS dementia complex (ADC) when in advanced HIV infection is advanced. Advanced HIV infection is defined as a CD4 count of <200 cells/uL by the Centers for Disease Control and Prevention (CDC). If the test is unavailable, one can use the clinical staging by the World Health Organization (WHO) which include: recurrent pneumonia, HIV wasting syndrome, chronic herpes simplex infection, extrapulmonary tuberculosis and esophageal candidiasis which are all absent in this patient. ADC presents with cerebral atrophy defined as a decrease in the total gray matter and parietal cortex volumes and increased total ventricular volumes in the parietal, temporal and frontal lobes particularly the hippocampus.[8] Patients having this disease present with neurocognitive impairment which is not present in our patient. The degree of cerebral brain atrophy is correlated with a low CD4 count and chronicity of HIV infection.

Cerebrospinal fluid abnormalities of neurosyphilis include of lymphocytic pleocytosis, elevated protein, decrease glucose and a positive non-treponemal and treponemal test. However, there is a different approach in patients co-infected with HIV. An algorithm on how to diagnose neurosyphilis coinfected with HIV is in Figure 3. The current dilemma is whether to do a lumbar puncture to test for neurosyphilis.

Lumbar puncture should be done on individuals with known syphilis in the following situations: neurologic or ophthalmic signs or symptoms in any stage of syphilis, evidence of active tertiary syphilis affecting other parts of the body, treatment failure (including failure of serum nontreponemal tests to fall appropriately) in any stage of syphilis, HIV infection with late latent syphilis or syphilis of unknown duration.[9] The treatment of neurosyphilis including ocular syphilis is aqueous crystalline benzathine penicillin G three to four million units every four hours for 10-14 days.[10] The response of this treatment to patients with neurosyphilis coinfected with HIV is still effective.[11]

Our patient, a 26-year-old male, presented with bilateral fronto-occipital headache with blurring of vision bilaterally. Patient was diagnosed with HIV and syphilis recently and not on treatment. The presence of blurring of vision may signify that patient may have ocular syphilis and so lumbar puncture was indicated. Lumbar puncture showed decrease in glucose, elevated protein, lymphocytic pleocytosis and a positive CSF treponema pallidum immunofluorescence which clinched the diagnosis of neurosyphilis. CT scan of the brain showed bitemporal lobe atrophy which may either be caused by neurosyphilis or with HIV itself. However, cerebral atrophy in these diseases usually occur in advance stages with corresponding neurocognitive deficits which was absent in this patient. Unfortunately, CD4 and T-cell count was not taken which could have been an important predictor for HIV associated brain atrophy. This case may lean toward the synergistic effect of both neurosyphilis and HIV towards brain atrophy.

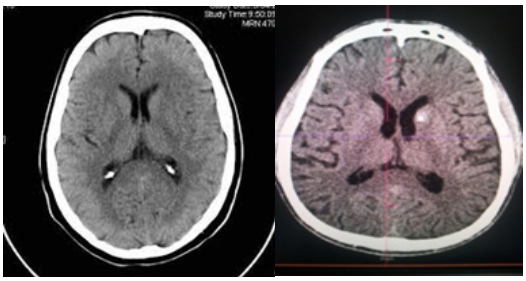

Figure 2. CT scan of the brain of a normal 26 year old male (Left). CT scan of the the patient with cerebral brain atrophy (Right)

Conclusion

The co-infection of neurosyphilis in an HIV patient is relatively rare with an increasing incidence in Asia and worldwide. The sequelae may lead to unpredictable course of manifestations and signs. In patients who have ocular syphilis and a more progressive course, it is recommended to do HIV testing.

Cerebral bitemporal lobe atrophy has been proven to be one the complications of advanced neurosyphilis with its corresponding neurocognitive manifestations. Therefore, the researchers recommend, that further investigation be done in relation to the possible synergistic effect of neurosyphilis when coinfected with HIV to cerebral bitemporal lobe atrophy. Further studies should emphasize the importance of early recognition and treatment to prevent irreversible brain damage in an otherwise curable disease.

References

1. **Abara et al.** Syphilis Trends among Men who have Sex with Men in the United States and Western Europe: A Systematic Review of Trend Studies Published between 2004 and 2015
2. **Chen SY, Gibson S, Katz MH, et al.** Continuing increases in Sexual Risk Behavior and Sexually transmitted Diseases among Men who have Sex with Men: San Francisco, California, 1999-2001, USA. Am J Public Health 2002; 92:1387.
3. **Mehrabian et al.** Neurosyphilis with Dementia and Bilateral Hippocampal Atrophy on Brain Magnetic Resonance Imaging 2012.
4. **Cohen et al.** Effects of Nadir CD4 Count and Duration of Human Immunodeficiency Virus Infection on Brain Volumes in the highly active Antiretroviral Therapy Era 2010; 16:25-32.
5. **Taylor MM, Aynalem G, Olea LM, et al.** A Consequence of the Syphilis Epidemic among Men who have Sex with Men (MSM): Neurosyphilis in Los Angeles, 2001-2004. Sexually Transmitted Disease 2008; 35:430
6. **Poliscli R, Vidal JE, Penalva Dc Oliveira AC, Hernandez AV**. Neurosyphilis in HIV-Infected Patients: Clinical Manifestation, Serum Venereal Disease Research Laboratory Titers and associated factors to symptomatic Neurosyphilis. Sexually Transmitted Diseases 2008; 35:425.

7. **Fonollosa A, Giralt J. Pelegrin L., Sanchez-Dalmau B, Segura A, Garcia-Arumi J and Adan A**. Ocular Syphilis-back again: Understanding recent increases in the incidence of Ocular Syphilitic Disease. OculImmunoInflamm 2009; 17: 207-12.
8. **Richard P. Knudsen.** Neurosyphilis. Medscape 2015.
9. **Stokes JH, Beerman H, Ingraham NR.** Modern Clinical Syphilology: Diagnosis, Treatement, Case Study, 3rd edition, WB Saunders, Philidelphia 1944.
10. **Kasper**: Harrisons Principles of Internal Medicine 19th edition 2015, New York, USA.
11. **Marra, Christina et al.**: Neurosyphilis. March 2013.