

## NEUROSYPHILIS – CASE REPORT

Sladjana Pavic M.D. PhD<sup>1</sup>, Ljiljana Jeremic M.D.<sup>2</sup>, Slobodan Jovičević M.D.<sup>3</sup>,  
Aleksandra Pavic<sup>4</sup>

<sup>1</sup>Department for Infectious and Tropical Diseases, General Hospital Uzice, Uzice, Serbia, e-mail: sladjanapj@gmail.com

<sup>2</sup>Department for neurology, General Hospital Uzice, Uzice, Serbia, e-mail: ljilja1309@gmail.com

<sup>3</sup>Emergency services, General Hospital Uzice, Uzice, Serbia, e-mail: slobodan.jovicevic@gmail.com

<sup>4</sup>School of Medicine, University of Belgrade, Belgrade, Serbia, e-mail: alexandratanapavic@gmail.com

**Abstract:** *Syphilis is inherited or acquired sexually transmitted disease caused by the spirochete Treponema pallidum. Tertiary syphilis may occur 3-15 years after the initial infection. In the tertiary stage, syphilis can be manifested as a gummy form, cardiovascular or neurosyphilis. We present a case of late-stage syphilis of a forty - year old, HIV-negative man. Predominant symptoms were dizziness, weakness and numbness of the extremities. VDRL was positive in serum and cerebrospinal fluid. MR findings pointed to multiischemic lesions, cortical, subcortical and cerebellar reduction changes, occlusion of cerebral arteries and slow overall final circulation within endocranial. Antibiotic therapy has led to the reduction of symptoms and clinical findings.*

**Key words:** *Treponema pallidum, central nervous system, tertiary stage, clinical course*

### 1. INTRODUCTION

Syphilis is a sexually transmitted disease caused by the bacterium *Treponema pallidum*. This is a multi-systemic disease [1, 2] with a chronic course and reactivations.

During 2015, there were 74,702 reported new diagnoses of syphilis (all stages). The majority of primary and secondary syphilis cases occurred among gay, bisexual, and other men who have sex with men (MSM). In 2015, MSM accounted for 81.7% of all primary and secondary syphilis cases among males in which sex of sex partner was known and 60% of all syphilis cases overall. However, in recent years, the rate of primary and secondary syphilis has been increasing among MSM as well as heterosexual men and women [3, 4].

Primary syphilis is characterized by a syphilitic ulcer at inoculation site which heals in 2-3 weeks. Secondary syphilis is seen at quarter of untreated patients, weeks or months after.

Tertiary syphilis is rare and develops in a subset of untreated syphilis infections. It can appear 1–30 years after infection [5], was first acquired, and it can be fatal. Tertiary syphilis can affect multiple organ systems, including the brain, nerves, eyes, heart, blood vessels, liver, bones, and joints [6]. Approximately 15 to 30 percent of people who do not receive treatment for syphilis will enter this stage. Syphilis can invade the nervous system at any stage of infection, and causes a wide range of symptoms, including headache, blindness, deafness, altered behavior, difficulty coordinating muscle movements, paralysis, sensory deficits, mental illnesses, memory loss, neurological disorders, such as stroke or meningitis [7]. Neurosyphilis is a “great imitator”. Its clinical manifestations lack specificity and may mimic several other disorders.

The majority of neurosyphilis cases have been reported in HIV-infected patients [8].

### 2. CASE REPORT

Forty year old male patient was treated on Department for Neurology and then on Department for Infectious and Tropical Diseases, General Hospital Uzice, in January 2010, due to dizziness and left side weakness. The symptoms began two months ago, during hard physical work. He did not report any fever, nausea, vomiting, headache. No diseases or substance abuse was described in his medical history. Patient was heterosexual, without history of sexually transmitted diseases, genital herpes or syphilis.

At the time of admission he was aware, disorient in self, place and time, without elevated body temperature, cardiac compensated. Auscultatory findings on the heart and lungs were normal. There was no palpable lymphadenopathy, or hepatosplenomegaly. Genital examination showed no rashes or ulcers.

In his mental examination: his self-hygiene was inadequate, had difficulty in pursuing his speech and stuck in certain words during speech. His gesture and mimics were decreased. Short-term memory was impaired, but remote memory was partially preserved. Attention, abstract thinking, reality testing and judgment were impaired. Associations in thinking process and its content were reduced. Psychomotor activity was slow.

In neurological examination: patient was alert, his orientation and cooperation were limited, speech was dysarthric. Pupillae were isocoric, direct and indirect light reflexes were bilaterally positive. Meningeal signs were negative. There was no lateralized sensory, or motor deficit. Cranial nerves were intact. Romberg test was positive. There were dyskinesias at mimic musculature. Pathological reflexes were not found.

Cerebrovascular disease was excluded due to absence of focal neurological signs. Progressive degeneration of central nervous system were excluded due to development of the symptoms in short time. In cranial MR imaging were detected cortical, subcortical and cerebellar reductive changes. MR imaging of blood vessels of the brain showed obliterative endarteritis to the right. The total blood flow was slow, more to the right.

Anti HIV antibodies and HIV antigen were negative. Electroencephalography were not detected changes. Ophthalmologic examination were not show pathological changes. Laboratory findings were within normal limits. Cerebrospinal fluid (CSF): proteins 0.88g/L ( normal 0.17 to 0.37g/L), there were not cell elements. The CSF bacterial, fungal and AFB cultures revealed no growth.

Diagnosis of syphilis was established by venereal disease research laboratory (VDRL) test in blood (1:16) and CSF (1:16) and by Treponema pallidum haemagglutination test (> 1:1280).

Patient was treated by penicillin G, 4 million units every four hours for 14 days. Controlling lumbar puncture showed that the protein in CSF was found at physiological levels. One month after the discharge, the patient returned for a follow-up evaluation and was found to have improved cognitive function, .

### 3. DISCUSSION

Neurosyphilis is a slow progressive, destructive infection of the brain and spinal cord. This is a rare clinical condition in HIV-negative patients for today. It can occur at any stage of syphilis, although symptomatic early neurosyphilis is a rare manifestation. There were not epidemiological dates related with syphilis in our patient, similar Acaarel et al [9] described case. The case of a patient with neurosyphilis and dementia has also been described Ozselek et al [10]. In both cases, as with us, there were no symptoms of the primary or secondary phase of the disease. The fact is that only 2% of patients with secondary syphilis have symptoms and more than two thirds of non-treated patients develop a neurosyphilis [11]. Most neurologic symptoms of early neurosyphilis result from acute or subacute meningitis, abnormalities in cranial nerve function and inflammatory vasculitis.

Neurosyphilis characterized by impairment of physical and mental capacity which is also shown in our case. He was the most eminent tremor of facial muscles and impairment of speech and writing.

The radiologic findings of neurosyphilis include cerebral infarctions (typically lacunar or middle cerebral artery in distribution) or nonspecific white matter lesions in meningovascular syphilis, cerebral gummas, or arteritis. The authors [12] suggest that the possible increase in the permeability of the blood-brain barrier, and meningeal inflammatory reaction from small vessel involvement lead to vasogenic edema and cytotoxic edema. They go on to describe that gliosis may be present as a secondary to infection-induced small-vessel ischemic changes. MR changes in our patient were non-specific and corresponds to the changes that have already been seen in most patients with neurosyphilis [13]. Success of neurosyphilis treatment is defined by normalization of clinical course and CSF [14]. Per current CDC recommendation, the CSF should be monitored, especially if it was pleocytosis. For patients who have neurologically symptoms or signs, resolution of clinical signs is considered when determining the efficacy of treatment [15]. In our patient, CSF normalization was achieved after 14 days of therapy, similar to the one described by Bozdemir et al [16]. One month after the discharge, the patient returned for a follow-up evaluation and was found to have improved cognitive function. VDRL was negative after 6 months.

The neurological finding of our patient was normal after 6 months. This indicates that the patient did not have a parenchymatous neurosyphilis characterized by irreversible neuronal damage, so the response to treatment is inadequate.

### 4. CONCLUSION

We presented a case of neurosyphilis that manifested with cognitive decline, neuropsychiatric features, like speech disturbances, parkinsonism, myoclonus and cerebellar ataxia. This was most likely the cerebral parenchymal form of infection, a clinical type of late-stage syphilis. After therapy, his symptoms disappeared.

Neurosyphilis is a treatable cause of dementia and movement disorders. Patients with cognitive impairment and movement disorders need to be tested on Treponema pallidum.

Early diagnosis and treatment of neurosyphilis should be applied to prevent an irreversible state of the disease.

---

#### 4. REFERENCES

1. BHARUCHA N.E.: *Infections of the nervous system*. In Bradley W.G.; Daroff R.B.; Fenichel G.M.: *Neurology in Clinical Practice*. Butterworth-Heinmann. 2000; 1334-5.
2. ADAMS R.D.; VICTOR M.; ROPPER A.H. (editors): *Principles of Neurology*. 7th edition. McGraw-Hill Companies. 2000; 722-8.
3. CENTERS FOR DISEASE CONTROL AND PREVENTION. *HIV Surveillance Report, 2014*; 2015; Vol. 26.
4. CENTERS FOR DISEASE CONTROL AND PREVENTION. *Sexually Transmitted Disease Surveillance, 2015*. GA: Department of Health and Human Services; 2016.
5. BIRNBAUM N.R.; GOLDSCHMIDT R.H.; BUFFET W.O.: *Resolving the common clinical dilemmas of syphilis*. *Am Fam Physician*. 1999; 59:2233-40.
6. POLSKY I.; SAMUELS S.C.: *Neurosyphilis screening does some-times reveal an infectious cause of dementia*. *Geriatrics*. 2001; 56:60-2.
7. CENTERS FOR DISEASE CONTROL AND PREVENTION. *Sexually Transmitted Diseases Treatment Guidelines, 2015*. *MMWR*. 2015; 64(RR-3).
8. LYNN W.A.; LIGHTMAN S.: *Syphilis and HIV: a dangerous combination*. *The Lancet Infectious Diseases*. 2004; 4: 456-66.
9. ACAREL E.E.; ASLAN I.K.; KARAGOZ N.; ALTIN U.; ORNEK I.; KURBAS D.: *HIV negatif norosifiliz olgu sunumu*. *Demans Dergisi*. 2002; 2: 27-31 (Article in Turkish).
10. OZSELEK S.; ERDEM M.; UZUN O.; ILICA A.T.; OZSAHIN A.: *A neurosyphilis case presenting with dementia*. *The Journal of Psychiatry and Neurological Sciences*. 2011; 24:145-8.
11. ROWLAND L.P.; STEFANIS L.: *Spirochete infections: neurosyphilis*: In Rowland L.P. (editor) *Merrit's Neurology*. 10th edition. Lippincot Williams&Wilkins. 2000; 182-5.
12. VIEIRA S. A.; MATIAS S.; SARAIVA P.; GOULAO A.: *Differential diagnosis of mesiotemporal lesions: case report of neurosyphilis*. *Neuroradiology*. 2005; 47:664-7.
13. PENG F.; HU X.; ZHONG X.; WEI Q.; JIANG Y.; ET ALL.: *CT and MR findings in HIV-negative neurosyphilis*. *Eur J radiol*. 2008; 66 (1): 1-6.
14. MARRA C.M.; MAXWELL C.L.; TANTALO L.C.; SAHI S.K.; LUKEHART S.A.: *Normalization of serum rapid plasma reagin titer predicts normalization of cerebrospinal fluid and clinical abnormalities after treatment of neurosyphilis*. *Clinical Infectious Diseases*. 2008; 47 (7): 893-9.
15. AHSAN S.; BURRASCANO J.: *Neurosyphilis: An Unresolved Case of Meningitis*. *Case Reports in Infectious Diseases*. 2015.
16. BOZDEMIR H.; TAMAM L.; OZEREN A.; ZEREN M.; SARICA Y.: *Neurosyphilis: Report of two patients*. *Annals of Medical Sciences* 2000; 9:27-30.