Case Report

NEUROSYPHILIS: DIAGNOSTIC CHALLENGES AND PUBLIC HEALTH RELEVANCE – A CASE REPORT

Merin Poulose[1*], Sreedeepan Mangalam[2], Anand Shajan[3], Varghese P Punnoose[4], Joice James[5]

1. Junior Consultant in Psychiatry, Taluk Head Quarters Hospital, Idukki, Kerala, 2. Consultant Neurologist, General Hospital, Kasaragod 3. Casualty Medical Officer, Taluk Head Quarters Hospital, Nedumkandam, Idukki, 4. Principal and Former Head, Department of Psychiatry, Government Medical College, Kottayam, 5. Junior Consultant in Dermatology, Taluk Head Quarters Hospital, Nedumkandam, Idukki

*Corresponding Author: Junior Consultant in Psychiatry, Taluk Head Quarters Hospital, Idukki, Kerala

Email: merinpoulosechira@gmail.com

Abstract

Background: Syphilis, caused by *Treponema pallidum*, remains a diagnostic challenge due to its varied clinical manifestations. Neurosyphilis, a late-stage complication, can mimic psychiatric disorders and lead to misdiagnosis. **Case Report**: A middle-aged woman presented with progressive cognitive decline, personality changes, and psychotic symptoms. She was initially mistaken for a primary psychiatric illness. Serological testing confirmed neurosyphilis, and treatment with intravenous penicillin resulted in marked improvement in neuropsychiatric features. This case emphasizes the importance of considering syphilis in atypical psychiatric presentations, particularly given its global resurgence. **Conclusion**: Early recognition and timely therapy are essential to prevent irreversible neurological damage, underscoring the need for heightened clinical vigilance and routine screening in at-risk populations.

Keywords: Neurosyphilis, Chronic meningovascular syphilis, Organic psychosis, Neuropsychiatry, Public health

INTRODUCTION

Neurosyphilis, once a prominent concern in the pre-antibiotic era, has re-emerged as a diagnostic challenge in contemporary clinical practice, with its ability to mimic a broad spectrum of neuropsychiatric disorders.[1] This case report describes neurosyphilis presenting with cognitive decline, personality changes, and psychosis in a community psychiatry setting, initially mistaken for primary psychiatric illness. It underscores the diagnostic challenges clinicians face in public health settings and the critical need for liaison with nearby tertiary centers. Furthermore, it highlights the value of routine syphilis serology in atypical neuropsychiatric presentations.

CASE REPORT

A 55-year-old woman from a rural village in the Idukki district, married, living with her husband, a cardamom estate worker for 25 years, with no comorbidities except allergic bronchitis, presented to the Psychiatry Outpatient Department of a taluk hospital in the Idukki district in June 2025. Her symptoms began insidiously one year ago with speech difficulties. Over time, she developed episodes of inappropriate laughing and crying. Subsequently, she experienced progressive lower limb weakness, recurrent falls, bradykinesia, rigidity, urinary incontinence, and marked social withdrawal. As the illness advanced, she became bedridden, with declining food intake and

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disturbed sleep. Additional features included hearing impairment and recurrent dyspnea.

The patient had no history of seizures, blurring of vision, genital ulcers, abnormal vaginal discharge, or fever with rashes. No relevant past medical, personal, or family history could be elicited.

The patient was alert and oriented to time, place, and person. Blood pressure was 170/100 mmHg, which could be stabilised using amlodipine 5mg daily. She maintained contact with reality and personal hygiene. Speech was effortful, with reduced verbal output. Behavioural assessment revealed apathy and anhedonia, along with auditory hallucinations characterized by voices prompting her to mutter and laugh to herself, as reported by her husband. Attention was poor, and there were deficits in short-term memory, confabulation, and global cognitive decline. The Mini-Mental Status Examination (MMSE) score was 11/30, indicating severe cognitive impairment. Higher mental function testing demonstrated frontal lobe dysfunction in the form of release signs, impaired abstraction, and difficulty performing alternating sequences, as well as temporal lobe deficits involving memory and language functions. Cranial nerve examination was normal except for bilateral sensorineural hearing loss. Motor examination showed increased axial tone with rigidity, bilateral upper limb weakness greater than in the lower limbs, and brisk deep tendon reflexes in all four limbs. The jaw jerk was exaggerated. Coordination testing demonstrated dysdiadochokinesia. She had a wide-based gait with reduced arm swing, postural instability, and frequent unsteadiness during ambulation.

The patient exhibited a frontotemporal syndrome with pyramidal, extrapyramidal, and cerebellar involvement, prompting differential diagnoses including behavioral variant frontotemporal dementia, CNS infections, cerebrovascular ischemia, and intracranial mass lesions. Haloperidol was initiated for psychotic symptoms, but there was no improvement, while blood pressure was controlled with amlodipine.

Routine blood counts were normal except for a high eosinophil count. Absolute Eosinophil count was 830. Thyroid, hepatic, and renal function tests, as well as random blood sugar, were normal. CRP was 1.77(normal). Rapid card tests for Human Immunodeficiency Virus (HIV), Hepatitis-B surface Antigen (HBsAg), and Hepatitis-C Virus (HCV) were negative. The VDRL (Venereal Disease Research Laboratory) card test was reactive. VDRL/RPR (Rapid Plasma Reagent) in dilution tests performed by flocculation was reactive in undiluted serum. Serum TPHA (Treponema Pallidum Haemagglutination Assay) was positive with a titer of 1:640. Magnetic Resonance Imaging (MRI) of the brain showed mild cerebral and cerebellar atrophy, with preferential atrophy of the perisylvian and perirolandic cortices.

She was provisionally diagnosed with neurosyphilis and referred to the Neurology Department of the nearest tertiary centre for confirmation and management. Cerebrospinal fluid (CSF) VDRL testing was negative. CSF Fluorescent Treponemal Antibody Absorption test,MRI spine was not performed due to financial constraints. Despite the negative CSF-VDRL, the clinical presentation and serological findings prompted treatment for neurosyphilis. She received IV crystalline Penicillin 24 million units/day, administered every 4 hours for 14 days, resulting in significant clinical improvement. By the third day, her weakness and dysarthria had resolved, and her communication and cognition had improved. Emotional incontinence, affective lability, and apathy were absent; however, increased psychomotor activity, persistent irritability, and expansive ideations were noted. On day 14, Sodium valproate 300mg daily was initiated, considering the possibility of a comorbid mood disorder. MMSE after 2 weeks was 26/30. She was treated further as an outpatient at the taluk hospital. Mood symptoms

improved, so no additional medications were prescribed, and regular follow-up was advised.

DISCUSSION

Syphilis, often termed *"the great imitator"* because of its diverse clinical presentations, was first described during the Renaissance. Its incidence declined markedly over the past century, particularly following the introduction of penicillin.[1] However, over the last two decades, syphilis has re-emerged as a significant public health challenge.[2] Multifactorial and intersecting influences drive this resurgence.[3] While these trends are predominantly reported among younger, urban populations, [2] our patient represents a different demographic context, underscoring the need to account for broader epidemiological patterns.

Symptoms in this patient suggested the possibility of frontotemporal dementia, intracranial neoplasm, or cerebrovascular pathology. However, the evolving profile of cognitive slowing, impaired attention and judgment, emotional lability, and intermittent psychotic features aligned more closely with the subtype-chronic meningovascular neurosyphilis.[1] This insidious form mimics various neurodegenerative and structural brain disorders. Furthermore, sensorineural deafness occurs in up to 20% of neurosyphilis cases[1] and hypothalamic involvement may produce polyuria, obesity, and somnolence—further obscuring the diagnosis. Additionally, serological tests are typically positive in blood but may be negative in CSF,[1] a discrepancy that complicates laboratory confirmation. These observations highlight the protean nature of neurosyphilis and reinforce the need for heightened clinical vigilance when confronted with atypical neuropsychiatric syndromes. Delayed diagnosis of neurosyphilis mimicking frontotemporal dementia has been associated with persistent neuropsychiatric symptoms.[4] Stefani et al et al documented significant clinical improvement in a patient with neurosyphilis presenting as dementia with movement disorder, following appropriate treatment. [5]

Given the rapid clinical improvement, we propose that the patient had chronic progressive frontotemporal meningoencephalitis secondary to meningovascular neurosyphilis, reflecting ongoing cortical dysfunction. Chronic perivascular and meningeal inflammation, fibrosis, granular ependymitis, cortical degeneration, and spirochaetal infiltration characterize this subtype.[6] Notably, neurosyphilis elicits a compartmentalized, robust neuroimmune response without direct neuronal injury.[7] The characteristic pathological involvement of the frontal and temporal lobes in this disease understandably led to its initial consideration of frontotemporal dementia as a differential diagnosis.

In an 11-year study by Yang et al,[8] 40.1% of 3524 neurosyphilis cases in China were symptomatic. General paresis was the most common symptomatic neurosyphilis subtype (46.8%), characterized by affective (66.7%) and memory symptoms (72.9%). Tabes dorsalis predominantly presented with neurological symptoms. Candy sign, typically seen in general paresis, was noted in 10.6% of cases, while girdle sensation—observed in 13 tabes dorsalis patients—emerged as a novel clinical finding. Panagiotis et al reported a case of neurosyphilis presenting with dementia and primary progressive aphasia, highlighting syphilis as a differential in early-onset dementia despite degenerative imaging findings.[9] In our patient, symptoms started as speech difficulties which progressed to nonfluent viscous speech with reduced verbal output and onset of both affective and memory disturbances alongside other neurological symptoms; however, the candy sign and girdle sensation were absent. This case report highlights the enduring relevance of

neurosyphilis as a diagnostic consideration in patients presenting with complex and progressive neurological and psychiatric symptoms.

Syphilitic ulcers facilitate HIV transmission, while HIV may alter the clinical course of syphilis, complicate diagnosis, and increase atypical manifestations, including neurosyphilis.[10] At the Taluk hospital, 2,683 VDRL tests were performed in 2024, of which 29 were reactive.[11] During the first six months of 2025, 1,368 tests were conducted, yielding 22 reactive results.[11] Among those with reactive VDRL tests, HIV screening identified one positive case in 2024 and one in 2025.[11] This patient is HIV-negative despite being VDRL reactive. Though rising VDRL reactivity at this centre mirrors global syphilis trends, HIV-syphilis coinfection rate here is lower than global estimates. This discrepancy highlights potential regional variations in transmission dynamics, warranting further epidemiological investigation.

The majority of syphilis cases are now diagnosed outside of traditional sexually transmitted infection (STI) clinics, highlighting healthcare providers' role in addressing this epidemic.[12] This patient also had approached a peripheral healthcare facility rather than a tertiary centre. As the epidemiological landscape shifts, clinicians must ensure early detection and strict adherence to treatment to limit the impact. According to the Centers for Disease Control and Prevention - STI guidelines, delayed diagnosis can cause irreversible harm, particularly in immunocompromised individuals.

This case highlights the rare diagnosis of neurosyphilis in a community psychiatry setting with limited access to advanced diagnostics. The patient's presentation—cognitive decline, personality changes, and psychosis without classical neurological signs—mimicked other psychiatric and vascular conditions, increasing the risk of misdiagnosis. Early consideration of a medical cause and prompt syphilis serology requires strong clinical vigilance. The patient's rapid improvement with penicillin underscores the treatable nature of neurosyphilis when identified early. This case reinforces the importance of routine serological screening for unexplained neuropsychiatric symptoms and integrated neuropsychiatric assessment in community mental health. Clinicians must stay up to date on guidelines and collaborate with public health systems to provide adequate care.

Ethics statement: Informed consent for publication was obtained from the patient and guardian (daughter)

The authors attest that there was no use of generative artificial intelligence (AI) technology in the generation of text, figures, or other informational content of this manuscript.

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