

# Neurosyphilis: Results of a multicentric ID-IRI study

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## Background

*T. pallidum* can affect the central nervous system (CNS) during any stage of syphilis. Clinical manifestations of neurosyphilis (NS) are highly variable. The aim of this multicenter study was to describe clinical features, laboratory findings and therapeutic regimen of 141 patients with NS.

## Methods

This multicenter study was performed retrospectively by the Infectious Diseases International Research Initiative (ID-IRI) study group to analyze the patients with NS. The study included 22 centers from 4 countries (Hungary, France, Turkey, USA) hospitalizing patients between 2000 and 2015. NS was diagnosed at any stage of syphilis. Patients with positive CSF VDRL test, and positive serum treponemal or nontreponemal serologic tests for syphilis were included.

## Results

A total of 141 patients were included in this study. (123 males; mean age 48.09±12.32). Asymptomatic NS were detected in 22 (15%), symptomatic meningitis in 67 (47%), meningovascular in 13 (9%), tabes dorsalis in 10 (7%), general paresis 13 (9%) and taboparesis in 16 patients (11%).

Thirty-two patients (22%) had immunosuppression (corticosteroid use and malignancy), 21 patients (14%) drug addiction, eight patients (5%) diabetes mellitus and one patient (0.7%) chronic renal failure. Forty-three patients (30%) of the total NS were detected as HIV positive. Symptoms and findings of the patients are shown in Table 1. Eye examination was performed in 76 patients. Ocular involvement caused by syphilis was detected in 19 patients (25%). 25 patients with NS underwent ear examination, and ear involvement was observed in the eight patients (32%).

Raised CSF pressure were detected in 22 patients (38%) among 57 patients who were measured for CSF pressure. The mean CSF cell count of 126 patients assessed for this parameter was 66,35±142,66 (median:21; min-max:0-1067). The mean CSF protein level were 159,14±588,33 (median:75; min-max:18-6700) for 132 patients who measured protein level. The CSF/blood rate were calculated in 108 patients. The average rate of CSF/blood were 0,56±0,10. Brain CT/MRI was performed in one hundred-three patients (Table 2).

**Table 2. Radiologic findings in neurosyphilis patients (n= 103)**

Imaging results	n	%
Normal brain imaging	70	67
Vasculitis	20	19
Hydrocephalus	11	10
Meningeal involvement	11	10
Cerebral atrophy	5	4
Spinal cord involvement*	2	3

\*Spinal imaging was performed in 57 patients

**Table 1. Symptoms and findings of the patients with neurosyphilis (n=141)**

Symptoms and findings	n	%
Headache	55	39
Fatigue	52	36
Altered consciousness	50	35
Fever	33	23
Nausea/vomiting	25	17
Atralgia	20	14
Weigh loss	17	12
Convulsions	7	4
Cranial nerve palsy	37	26
Signs of meningeal irritation	19	13
Fever	17	12
<b>Tabetic symptoms</b>	<b>28</b>	<b>19</b>
Walking disorder	16	11
Ataxia	10	7
Romberg positivity	6	4
Argyl-Robertson pupil	5	3
Syphincter dysfunction	5	3
Loss of autonomy	1	0.7
<b>Paretic symptoms</b>	<b>32</b>	<b>22</b>
Emotional variability	20	14
Forgetfulness	17	12
Decline in mental and cognitive abilities	13	9
Carelessness	10	7
Sensory impairment	8	5
Psychiatric disorder	6	4
Paranoia	5	3
Tremor	2	1
Dementia	2	1
<b>Vascular symptoms</b>	<b>39</b>	<b>27</b>
Dizziness	26	18
Speech impairment	15	10
Paraparesis/ paraplegia	7	4
Hemiparesis/hemiplegia	4	2
Hyperactivity in reflex	3	2
Stroke	2	1
Hypoesthesia	1	0.7

Aqueous penicillin G, procaine G penicillin, ceftriaxone, doxycycline were used in 109 (77%), seven (4%), 31 (21%), and in five patients (3%), respectively. The average length of stay in the hospital for patients with NS were 17,45±13,70 days.

The outcomes of 136 patients were known. Cure, neurological sequelae, relapse, mortality were detected in 64(47%), 56 (39%), one (0,7%), and in 6 patients (4%), respectively. Nine patients died due to other reasons.

## Conclusion

A high suspicion of NS among patients with a history of syphilis, and particularly in patients with HIV co-infection should be maintained for early diagnosis.