

Tropical Spastic Paraparesis Management with Herbal Neurogenic: A New Hope

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ABSTRACT

Tropical spastic paraparesis (TSP), a disease of the nervous system, is caused by human T-lymphotropic virus type 1, thus also known as HTLV-1 associated myelopathy. It is common among females of age group 30-50 years. In spite of advancement in diagnostic procedures, i.e., CT scan, MRI, etc., its treatment with α -interferon, steroids, antiviral drugs, neuro-vitamin supplementation, physiotherapy fails to ensure cure or improve quality-of-life except transient pain relief with analgesics and muscle relaxants. Thus, a therapeutic regime composite consisting of a proven herbal neurogenic has been evaluated. **Objective of the study:** To assess the herbal neurogenic and immune boosting composite in ensuring clinical relief and improving quality-of-life in patients deterred from various medicenters without any relief. **Material and methods:** Sixty-three diagnosed and already treated cases of tropical spastic paraparesis, attending the Centre for Critical Care, National Institute of Health and Research, Warisaliganj (Nawada), Bihar, were selected, interrogated, examined clinically, assessed and analyzed for their previous investigation reports, therapy taken and their effect. Irrespective of their clinical severity, all patients were advocated the prescribed regime and were followed for 2 years post-therapy for which patients were given a follow-up card to record the changes. **Result:** Approximately 88.9% patients had Grade I clinical response while rest 11.1% had Grade II clinical response without any untoward effect or any withdrawal during post-therapy 2 years follow-up. **Conclusion:** The present regime constituting intravenous calcium gluconate, intravenous methylcobalamin + pyridoxine + niacin, self-blood (2 mL) and intramuscular betamethasone 2 mg, capsule cholecalciferol 60K, syrup herbal neurotonic proved its worth in the management of TSP even in chronic and long-term treated cases.

Keywords: Tropical spastic paraparesis, human T-lymphotropic virus type 1, CT, MRI, herbal neurogenic, quality-of-life

Tropical spastic paraparesis (TSP), a chronic and progressive clinical condition affecting the nervous system, remained of obscure etiopathogenesis for long, but nowadays, an important association of this condition has been established with human retrovirus (Human T-cell lymphotropic virus type 1), thus this condition is also termed as HTLV-1 associated myelopathy (HAM).

As per World Health Organization (WHO) estimate, worldwide 10-20 million people are carrying HTLV-1 and

5% of them are affected with TSP in the age group of 30-50 years.

TSP is very common in Latin America, the Caribbean Basin, sub-Saharan Africa and Japan, but these days, incidence of this clinical state is increasing even in India.

Common presentation of the clinical condition is:

- ⇒ Gradual weakening and stiffening of lower extremity
- ⇒ Radiating back pain down to legs
- ⇒ Burning and pricking sensation (paresthesia)
- ⇒ Urinary and bowel function disturbances
- ⇒ Erectile dysfunction in males
- ⇒ Inflammatory skin condition, like dermatitis or psoriasis
- ⇒ Rarely may present with eye inflammation, arthritis and muscle inflammation.

The common mode of transmission of this virus is through:

- ⇒ Breastfeeding

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- Sharing infected needles during intravenous drug use
- Sexual activity
- Blood transfusions.

In spite of advancement in diagnostics (computed tomography [CT] scan and magnetic resonance imaging [MRI]) and its established etiopathogenesis, till date, no established therapeutic regime has ensured its reversal but only symptomatic relief through α -interferon, intravenous immunoglobulin, antiviral drugs and muscle relaxants is available.

Signs and symptoms vary but may include slowly progressive weakness and spasticity of one or both legs, exaggerated reflexes, muscle contractions in the ankle and lower back pain. Other features may include urinary incontinence and minor sensory changes, especially burning or prickling sensations and loss of vibration sense.

Considering the poor quality-of-life with present therapeutics, a clinical study was planned to evaluate the clinical efficacy of proved neurogenic herbal composite with neuromodulator at National Institute of Health and Research and Centre for Research in Indigenous Medicine.

OBJECTIVE OF THE STUDY

To evaluate the clinical efficacy and safety profile of herbal neurogenic with neuromodulator in TSP.

Duration of Study

January 2014 to December 2018.

MATERIAL AND METHODS

Material

Proved and treated cases of TSP without any clinical response, attending the Centre for Critical Care, National Institute of Health and Research, Warisaliganj (Nawada), Bihar were considered for evaluation of the herbal neurogenic constituting therapeutic regime.

Methods

Patients of spastic paraparesis diagnosed by myelogram, CT and MRI were interrogated thoroughly for the onset, duration and evolution of the disease, family history of neurological illness, history of extramarital sexual exposure, abortion, blood transfusions, dietary choices with emphasis on strict vegetarianism, *Lathyrus sativus* use, socioeconomic status, housing, sanitary conditions, treatment taken and their response. A detailed general examination and a meticulous neurological assessment were done.

Based on clinical presentation, patients were classified as summarized in Table 1.

Patients were investigated for hemoglobin concentration, total and differential leukocyte count, erythrocyte sedimentation rate (ESR), peripheral smear, fasting and postprandial blood sugar, renal and liver function tests and serological test for syphilis. Common presentation of TSP is summarized in Table 2.

All patients underwent conventional myelography, CT and MRI scans. The serum samples of all the patients were tested for HTLV-1 antibodies by the Serodia technique. All patients presenting with this crippling disease were advised and administered the following therapeutic regime after due awareness counseling and encouragement:

- Injection calcium gluconate 1 amp every 15th day intravenous, very slow
- Injection methylcobalamin + pyridoxine + niacinamide + pantothenic acid + betamethasone every week

Table 1. Clinical Presentation-based Classification

Severity Grade	Characteristics
Mild	Patients presenting with back pain, tingling and numbness in the leg
Moderate	Patient presenting with back pain, tingling and numbness, tendency to fall, heaviness in the lower extremity, leg weakness
Severe	Back pain, gait disturbance, stumbling, leg weakness, hyperreflexia and extensor plantar reflex, overactive bladder, constipation and sexual dysfunction

Table 2. Common Presentation of Tropical Spastic Paraparesis

Disturbances	Symptoms	Signs
Motor	Gait disturbance, tendency to fall, stumbling and leg weakness	Spastic paraparesis, weakness hyperreflexia lower limb, clonus, extensor plantar reflex
Sensory	Pain, numbness at lumbar level and backache	Feet paresthesia, loss of light touch sensory level at lower thoracic level
Autonomic	Urinary dysfunction, constipation, sexual dysfunction	Neurogenic or overactive bladder, diminished peristalsis, erectile dysfunction

- Injection self-blood + betamethasone 2 mg every 10th day intramuscular
- Capsule vitamin D₃ 60K every week orally
- Syrup herbal neurogenic 10 mL every 12 hours/
Capsule herbal neurogenic 1 cap every 12 hours
- Active and passive exercise of the extremity
- Diet: High protein vegetarian diet.

Herbal composite neurogenic capsule 500 mg or syrup 5 mL constitutes 100 mg each of *Acorus calamus* (rhizome), *Nardostachys jatamansi* (flower), *Herpestis monniera* (leaf), *Convolvulus pluricaulis* (flower) and *Cassia acutifolia* (seed).

Patients were assessed for improvement in tone and power of the muscle, tingling and numbness, gait and autonomic function (passage of stool and urine) for which patients were given a follow-up card to mention date of achievement and any untoward manifestation experienced. Patients were advised to visit the center on any unusual manifestation or contact on helpline for needful redresses. To adjudge the safety profile of the regime practiced, basic bio-parameters were repeated every month for first 3 months and then every 3 months.

Based on the clinical outcome and safety profile therapeutic response was graded as Table 3.

RESULT

Sixty-three identified, diagnosed and treated patients of TSP were considered for the study and out of them, majority (30/63) were in the age group 30-35 years with female dominance (Table 4 and Fig. 1) and all were from rural background. The community representation is depicted in Figure 2.

Majority of the patients was nonvegetarian and none had any history of taking *Lathyrus sativus* (Fig. 3).

The age of onset of clinical presentation varied from 20 to 40 years and duration of illness from 1 to 12 years (Fig. 4). Symptoms at the onset were difficulty

Table 3. Grade of Therapeutic Response	
Clinical Grade	Characteristics
Grade I	Complete recovery of power and tone without any residual neurological deficit and adversity
Grade II	Improvement in power and tone with residual paresis and sensory deficit without any adversity
Grade III	No alteration in status

Age group (years)	Number of patients		
	Male	Female	Total
30-35	02	28	30
35-40	04	12	16
40-45	-	06	06
45-50	-	11	11

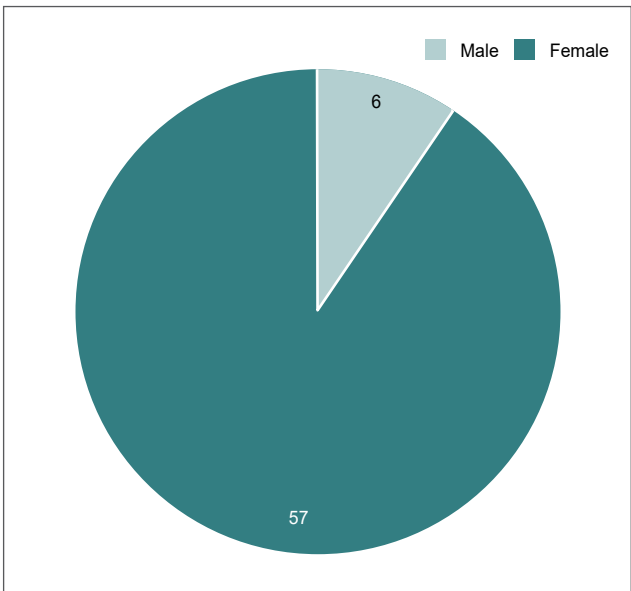


Figure 1. Pie diagram showing distribution as per sex.

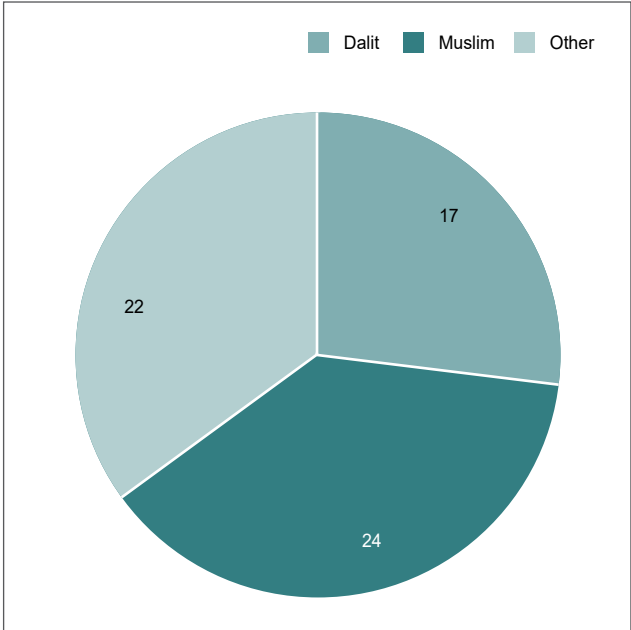


Figure 2. Pie diagram showing distribution of patients as per community.

in walking, stiffness of legs, back pain, weakness of legs, leg pain and urinary discomfort (Table 5) while presentation at our center included disturbed gait, leg stiffness, back pain, leg pain, urinary discomfort, urinary retention, tingling and numbness and erectile dysfunction in males (Table 5).

No history of blood transfusion, abortion, delivery or surgery prior to onset of the disease was evident but serum samples tested positive for HTLV-1 in 49 cases out of 63 (Fig. 5). In addition, all the bio-parameters (hepatic, hematological and renal profile) were normal. No patients were positive for tuberculosis, any sexually

transmitted disease. In terms of clinical severity, out of 63 patients, 13 were of moderate and 50 were of severe status (Fig. 6).

Patients had taken treatment with α -interferon, muscle relaxants, neuro-vitamin supplementation at various medicare centers without any positive therapeutic outcome (Table 6). Symptomatic relief started from 4th week of therapy and by 24th week, all had symptomatic relief (Fig. 7).

The minimum and maximum duration of therapy required for complete reversal of clinical presentation

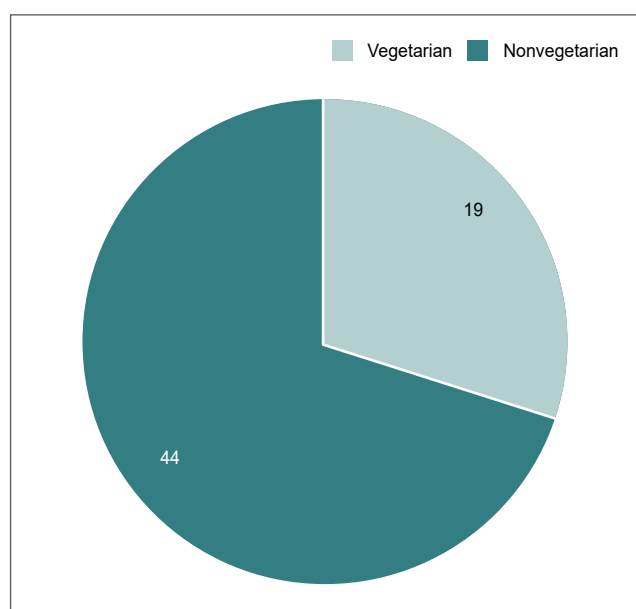


Figure 3. Pie diagram showing distribution of patients as per dietary status.

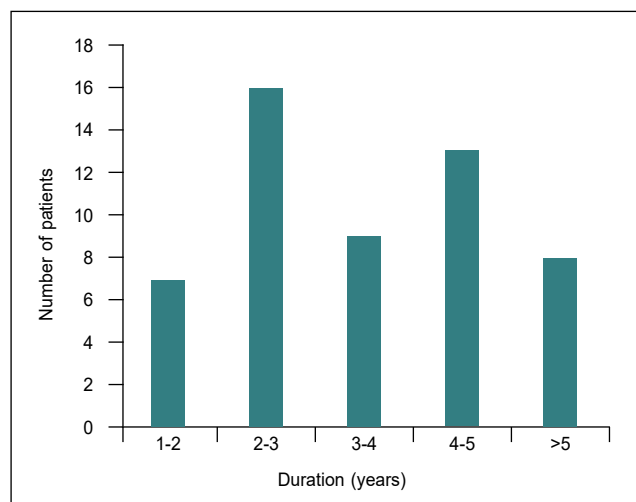


Figure 4. Bar diagram showing distribution of patients as per duration of illness.

Table 5. Distribution of Patients as per their Clinical Presentation

Clinical presentation	Number of patients
Difficulty in walking	63
Leg stiffness	63
Back pain	43
Weakness of the legs	63
Leg pain	63
Tingling and numbness	63
Gait disturbance	50
Urinary discomfort	50
Sexual weakness	06
History of surgery, abortion and blood transfusion	None

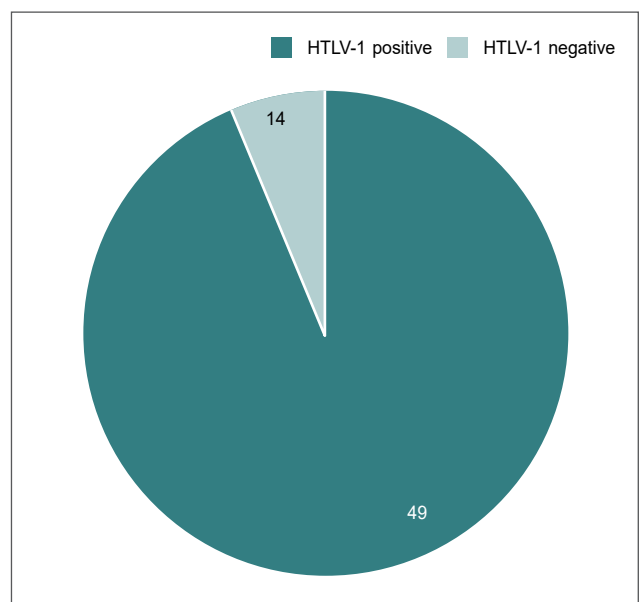


Figure 5. Pie diagram showing HTLV-1 status of the patients.

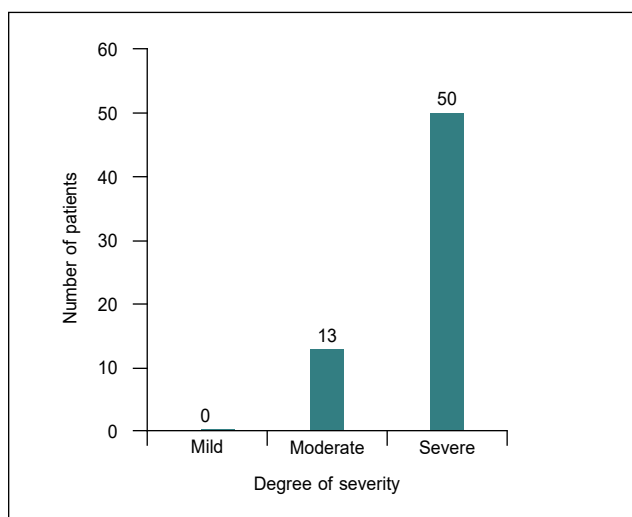


Figure 6. Bar diagram showing clinical severity of illness.

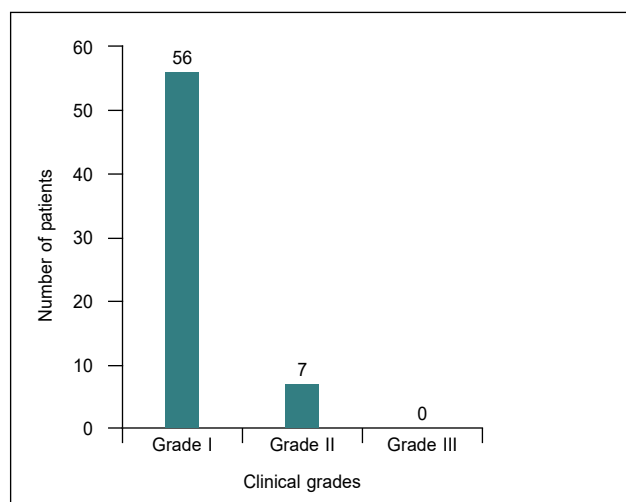


Figure 8. Bar diagram showing grades of clinical response.

Table 6. Treatments Taken in Past

Therapy taken	Number of patients
α -interferon	43
Antiviral drug	49
Muscle relaxants	63
Neuro-vitamin supplement	63
Active and passive exercise	63

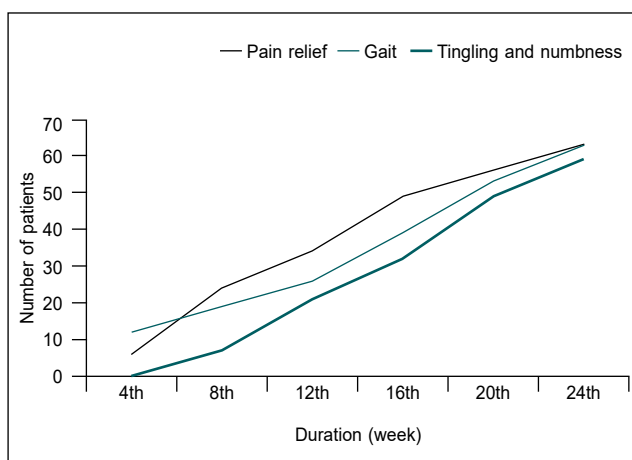


Figure 7. Graph showing duration required for improvement in presentation.

(both symptom and sign) was 9 months and 2 years, respectively. In all, 56 patients achieved Grade I clinical improvement and 7 achieved Grade II improvement (Fig. 8). No patients had shown any adversity, recurrence of presentation or any alteration in bio-parameters in 2 years of post-therapy follow-up (Table 7).

DISCUSSION

Tropical spastic paraparesis is becoming a common neurological disorder in India though it is common in different parts of the world including Jamaica, Martinique, Seychelles, Colombia and Japan. While it was considered as a neurological disorder of obscure etiology, these days, it is proved to be caused by HTLV-1. In spite of advancement in diagnostics like CT, MRI, cerebrospinal fluid (CSF) and serum for HTLV-1 antigen, the therapeutics used, i.e., α -interferon, muscles relaxant and neuro-vitamin supplement, fail to ensure cure or improve quality-of-life, except for transient symptomatic relief.

The current study showed clinical supremacy in terms of marked improvement in pain, sensation and gait of the already treated patients with other regime and achieving Grade I clinical response in 88.9% patients and Grade II in rest 11.1%. No patients had any withdrawal or drug adversity in 2 years post-therapy follow-up. This clinical efficacy can be explained considering the pathogenesis and causation due to HTLV-1 infected T cells (Fig. 9).

Self-blood with betamethasone intramuscular induces antibody formation against the released toxin and ensure their neutralization, while betamethasone, acting as anti-inflammatory agent, reduces neural edema, which is synergized by intravenous calcium administration.

Methylcobalamin, pyridoxine, niacin and pantothenic acid support neural cells in its normal neural conduction and a herbal neurogenic, by its neurogenic activity helps in restoration of neural viability and vitality which combinely ensure relief in pain, neuropathic

Table 7. Outcome of the Study

Particulars	Number of patients								
	1	2	3	4	5	6	9	12	24
Duration in months									
Clinical relief	6	24	34	44	56	63	63	63	63
Back pain	14	24	32	45	63	63	63	63	63
Tingling numbness	12	19	26	39	53	63	63	63	63
Pain in legs	12	21	24	37	48	63	63	63	63
Autonomic disturbance	–	–	19	30	42	50	63	63	63
Gait	–	4	14	22	32	50	63	63	63
Post-therapy bio-parameters									
Hepatic profile:									
SGOT (<35 IU)	63	63	63	63	63	63	63	63	63
SGPT (<35 IU)	63	63	63	63	63	63	63	63	63
Alkaline phosphatase (<100)	63	63	63	63	63	63	63	63	63
Renal parameters									
Blood urea (<26 mg%)	63	63	63	63	63	63	63	63	63
Serum creatinine (<1.5 mg%)	63	63	63	63	63	63	63	63	63
Urine									
Albumin-Negative	63	63	63	63	63	63	63	63	63
RBC-Negative	63	63	63	63	63	63	63	63	63
Hematological									
Hemoglobin (>10 gm%)	52	58	59	63	63	63	63	63	63
Clinical grade									
Grade I									56
Grade II									07
Grade III									

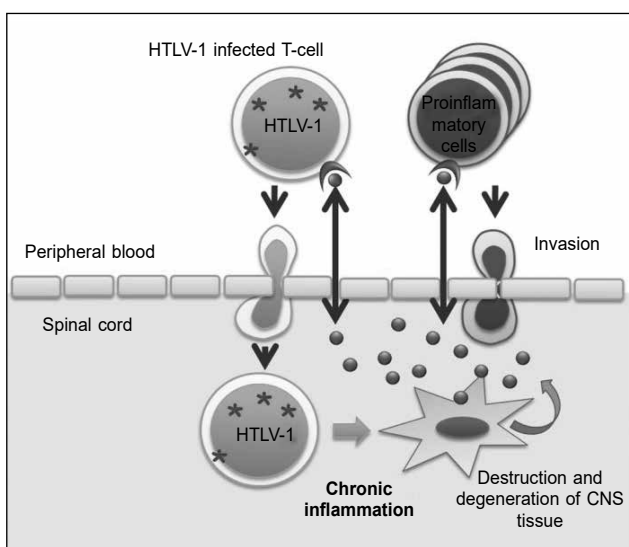


Figure 9. Pathogenesis and causation due to HTLV-1 infected T cells.

manifestation, gait and autonomic function and provide better quality-of-life to all.

CONCLUSION

Present regime constituting calcium gluconate intravenous, methylcobalamin + pyridoxine + niacin intravenous, self-blood (2 mL) and betamethasone 2 mg intramuscular, capsule cholecalciferol 60K, syrup herbal neurogenic proved its worth in the management of TSP even in chronic and long-term treated cases.

SUGGESTED READING

1. World Health Organization (WHO). Report of the scientific group on HTLV-1 and diseases, Kagoshima, Japan, December, 1988. Virus Diseases, Human T-lymphotropic virus type 1, HTLV-1. Wkly Epidemiol Rec. 1989;64:382-3.

2. Orland JR, Engstrom J, Frider J, Sacher RA, Smith JW, Nass C, et al; HTLV Outcomes Study. Prevalence and clinical features of HTLV neurologic disease in the HTLV Outcomes Study. *Neurology*. 2003;61(11):1588-94.
3. Blattner WA, Gallo RC. Epidemiology of human retroviruses. *Leuk Res*. 1985;9(6):697-8.
4. Oomman A, Madhusoodanan M. Tropical spastic paraparesis in Kerala. *Neurol India*. 2003;51(4):493-6.
5. Román GC. The neuroepidemiology of tropical spastic paraparesis. *Ann Neurol*. 1988;23 Suppl:S113-20.
6. Arango C, Concha M, Zaninovic V, Corral R, Biojo R, Borrero I, et al. Epidemiology of tropical spastic paraparesis in Columbia and associated HTLV-1 infection. *Ann Neurol*. 1988;23 Suppl:S161-5.
7. Richardson JH, Newell AL, Newman PK, Mani KS, Rangan G, Dagleish AG. HTLV-I and neurological disease in South India. *Lancet*. 1989;1(8646):1079.
8. Gessain A, Barin F, Vernant JC, Gout O, Maurs L, Calender A, et al. Antibodies to human T-lymphotropic virus type-I in patients with tropical spastic paraparesis. *Lancet*. 1985;2(8452):407-10.
9. Rubin M. Tropical spastic paraparesis/HTLV-1-associated myelopathy (TSP/HAM). *Merck Manual*. October, 2016. Available at: <http://www.merckmanuals.com/professional/neurologic-disorders/spinal-cord-disorders/tropical-spastic-paraparesis-htlv-1%E2%80%93associated-myelopathy-tsp-ham>.
10. Tropical spastic paraparesis information page. National Institute of Neurological Disorders and Stroke. Available at: <https://www.ninds.nih.gov/Disorders/All-Disorders/Tropical-Spastic-Paraparesis-Information-Page>. Accessed on Dec 7, 2017.
11. Iwasaki Y. Pathology of chronic myelopathy associated with HTLV-I infection (HAM/TSP). *J Neurol Sci*. 1990;96(1):103-23.
12. Izumo S, Umehara F, Osame M. HTLV-1 associated myelopathy. *Neuropathology*. 2000;20:565-8.
13. Osame M. Pathological mechanisms of human T-cell lymphotropic virus type I-associated myelopathy (HAM/TSP). *J Neurovirol*. 2002;8(5):359-64.
14. Lezin A, Olindo S, Oliere S, Varrin-Doyer M, Marlin R, Cabre P, et al. Human T lymphotropic virus type I (HTLV-I) proviral load in cerebrospinal fluid: a new criterion for the diagnosis of HTLV-I-associated myelopathy/tropical spastic paraparesis? *J Infect Dis*. 2005;191(11):1830-4.
15. Matsuzaki T, Nakagawa M, Nagai M, Usuku K, Higuchi I, Arimura K, et al. HTLV-I proviral load correlates with progression of motor disability in HAM/TSP: analysis of 239 HAM/TSP patients including 64 patients followed up for 10 years. *J Neurovirol*. 2001;7(3):228-34.
16. De Castro-Costa CM, Araújo AQ, Barreto MM, Takayanagui OM, Sohler MP, da Silva EL, et al. Proposal for diagnostic criteria of tropical spastic paraparesis/HTLV-I-associated myelopathy (TSP/HAM). *AIDS Res Hum Retroviruses*. 2006;22(10):931-5.
17. Bagnato F, Butman JA, Mora CA, Gupta S, Yamano Y, Tasciyan TA, et al. Conventional magnetic resonance imaging features in patients with tropical spastic paraparesis. *J Neurovirol*. 2005;11(6):525-34.
18. Scadden DT, Freedman AR, Robertson P. Human T-lymphotropic virus type I: Disease associations, diagnosis, and treatment. Waltham, MA: UpToDate; February 16, 2016. Available at: <http://www.uptodate.com/contents/human-t-lymphotropic-virus-type-i-disease-associations-diagnosis-and-treatment>.
19. Sandbrink F. Tropical myeloneuropathies treatment & management. January 2015. Available at: <http://emedicine.medscape.com/article/1166055-treatment>.
20. Arimura K, Nakagawa M, Izumo S, Usuku K, Itoyama Y, Kira J, et al. Safety and efficacy of interferon-alpha in 167 patients with human T-cell lymphotropic virus type 1-associated myelopathy. *J Neurovirol*. 2007;13(4):364-72.
21. Croda MG, de Oliveira AC, Vergara MP, Bonasser F, Smid J, Duarte AJ, et al. Corticosteroid therapy in TSP/HAM patients: the results from a 10 years open cohort. *J Neurol Sci*. 2008;269(1-2):133-7.
22. Taylor GP, Goon P, Furukawa Y, Green H, Barfield A, Mosley A, et al. Zidovudine plus lamivudine in human T-lymphotropic virus type-I-associated myelopathy: a randomised trial. *Retrovirology*. 2006;3:63.



New Risk Factors Tied to Increased Risk of COVID-19 Identified in Study

Researchers have identified associations between certain lifestyle factors and an individual's risk of getting COVID-19 infection.

It is known that people with type 2 diabetes and a high body mass index (BMI) have an increased risk of hospitalizations and other severe complications related to COVID-19. They also have a greater risk of getting the symptomatic infection in the first place, reported a recent study published in the journal *PLoS One*. Investigators noted that those with positive COVID-19 test results had a greater likelihood of being obese or having type 2 diabetes. Those who tested negative had higher odds of having high levels of high-density lipoprotein (HDL) cholesterol and a healthy weight with a normal BMI... (HT – ANI)

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