

## Tropical Spastic Para Paresis Management - A New Hope

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### ABSTRACT

Tropical spastic para paresis a disease of nervous system is caused by Human T lymphotropic virus type I thus also known as HTLV-I associated myelopathy and common among female of age group 30-50 years in approximately 2-3% of HTLV-I affected person.

In spite advancement in diagnostic procedure, i.e., CT scan, MRI its treatment with  $\alpha$ -interferon, steroid, antiviral drugs, neurovitamin 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 a proven herbal neurogenic been evaluated

**Objective of study:** To assess the herbal neurogenic and immune boosting composite in ensuring clinical relief and improving quality of life in patients deterred from various medi centres without any relief.

**Materials and methods:** 63 diagnosed and already treated cases of tropical spastic para paresis attending at Centre For Critical Care National Institute of Health and Research Warisaliganj (Nawada), Bihar been selected, interrogated, examined clinically, assessed and analysed their previous investigation reports, therapeutics taken and their effect.

Irrespective of their clinical severity all patients were dvocated the prescribed regime and were followed for post therapy 2 years for which patients been given a follow up card to record the changes.

**Results:** 88.9% patients had grade I clinical response while rest 11.1% grade II without any untoward effect or any withdrawal during post therapy 2 years follow up.

**Keywords:** Tropical spastic para paresis, Human T lymphotropic virus - type I, CT, MRI, Herbal neurogenic, Quality of life

### INTRODUCTION

Tropical spastic para paresis, a chronic and progressive clinical condition affecting nervous system remained of obscure etiopathogenesis for long but now a days an important association of this condition been established between Human retrovirus (Human T cell lymphotropic virus type I) thus this condition is also termed as HTLV1 associated myelopathy (HAM).

As per WHO estimate worldwide 10-20 million peoples are carrying HTLV1 and 5% of it are affected with TSP of age group 30-50 years [1-10].

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 [11-14]:

- Gradual weakening and stiffening of lower extremity
- Radiating back pain down to legs

- Burning and pricking sensation (paraesthesia)
- Urinary and bowel function disturbances
- In male erectile dysfunction
- Inflammatory skin condition like dermatitis or psoriasis
- Rarely may present with eye inflammation, arthritis and muscle inflammation

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The common mode of transmission of this virus is through [15,16]:

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

In spite of advancement in diagnostics (CT scan and MRI) and it's established etiopathogenesis till date no established therapeutic regime ensured its reversal but only symptomatic relief, i.e.,  $\alpha$ -interferon, intravenous immunoglobulin, antiviral drugs and muscle relaxants Tizanidine.

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 neuro modulator at National Institute of Health and Research and Centre for Research in Indigenous Medicine.

**OBJECTIVE OF THE STUDY**

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

**MATERIALS AND METHODS**

**Duration of study**

January 2014 to December 2018.

**Materials**

Patients of proved and treated cases of Tropical spastic Para paretic without any clinical response, attending at Centre for Critical Care, National Institute of Health and Research were considered for evaluation of the herbal neurogenic constituting therapeutic regime.

**Methods**

Patients of spastic para paretic diagnosed by myelogram, Computerized Tomography (CT) and Magnetic Resonance Imaging (MRI) been 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 with emphasis on strict vegetarianism, *Lathyrus sativus*, socio-economic 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 **(Box 1)**:

**Box 1.** Classification of patients.

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

Patients were investigated for hemoglobin concentration, total and differential leucocyte 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 can be summarized as **(Box 2)**:

**Box 2.** Common presentation of TSP.

| Disturbances | Symptoms   | Sign  |
|--------------|--|---|
| Motor        | Gait disturbance, tendency to fall, stumbling and leg weakness | Spastic para paretic, weakness, Hyper reflexia lower limb, clonus, Plantar extensor |
| Sensor       | Pain, numbness at lumbar level and back                        | 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      |

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 (**Box 3**):

**Box 3.** Therapeutic regime.

|   |
|---|
| Inj Calcium gluconate 1 amp every 15 <sup>th</sup> day intravenous very slow                  |
| Inj Methyl cobalamine + Pyridoxin + Niacinamide + Pantothenic acid + Betamethasone every week |
| Inj Self blood + Betamethasone 2 mg every 10 <sup>th</sup> day intramuscular                  |
| Cap Vitamin D <sub>3</sub> 60 K every week orally   |
| Syrup NEUROVIT 10 ml every 12 h/Cap NEUROVIT 1 cap every 12 h                                 |
| Active and passive exercise of the extremity  |
| Diet: High Protein vegetarian diet  |

Herbal composite NEUROVIT Syr or Capsule constitutes - Cap 500 mg or Syr. 5 ml constitutes 100 mg each of *Acorus calamus* (rhizome), *Nardostachys jatamansi* (Flower), *Herpestis monnieri* (leaf), *Convolvulus pluricaulis* (flower), *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 three month and then every 3 months.

Based on the clinical outcome and safety profile therapeutic response was graded as (**Box 4**):

**Box 4.** Therapeutic responses based on the clinical outcome and safety profile.

| 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   |

**RESULTS**

63 identified, diagnosed and treated patients of tropical spastic para paresis considered for study were of age group

30-50 years and out of them majority (30/63) were of age group 30-35 years with female dominance (**Table 1 and Figure 1**) and all were from rural background and community representation was (**Figure 2**).

**Table 1.** Shows distribution of patients as per age and sex.

| Age Group (in 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    |

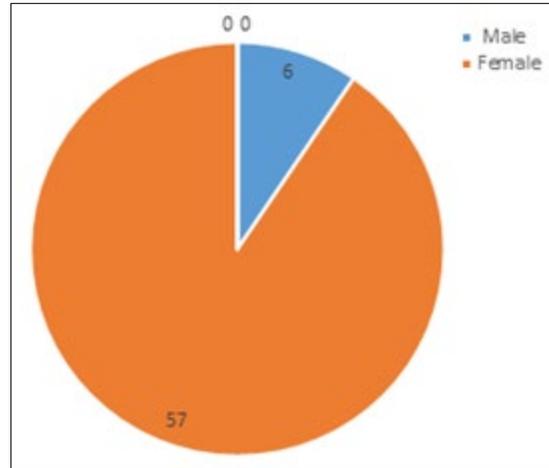


Figure 1. Pie diagram showing male:female composition.

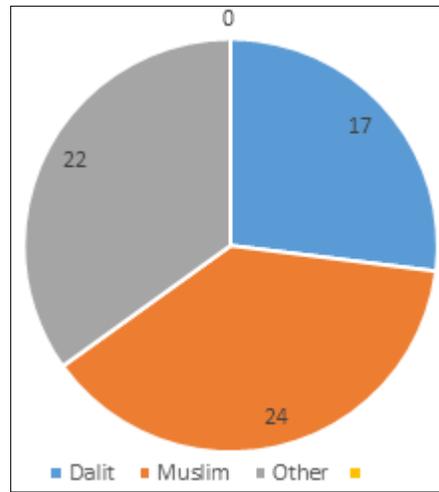


Figure 2. Pie diagram showing distribution of patients as per community.

Out of all majorities were non vegetarian and non-had any history of taking *Lathyrus sativus* (Figure 3).

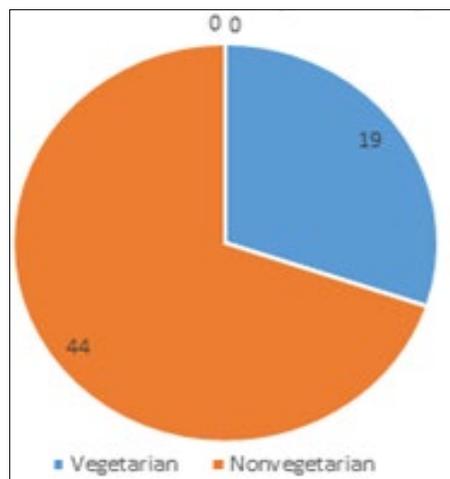
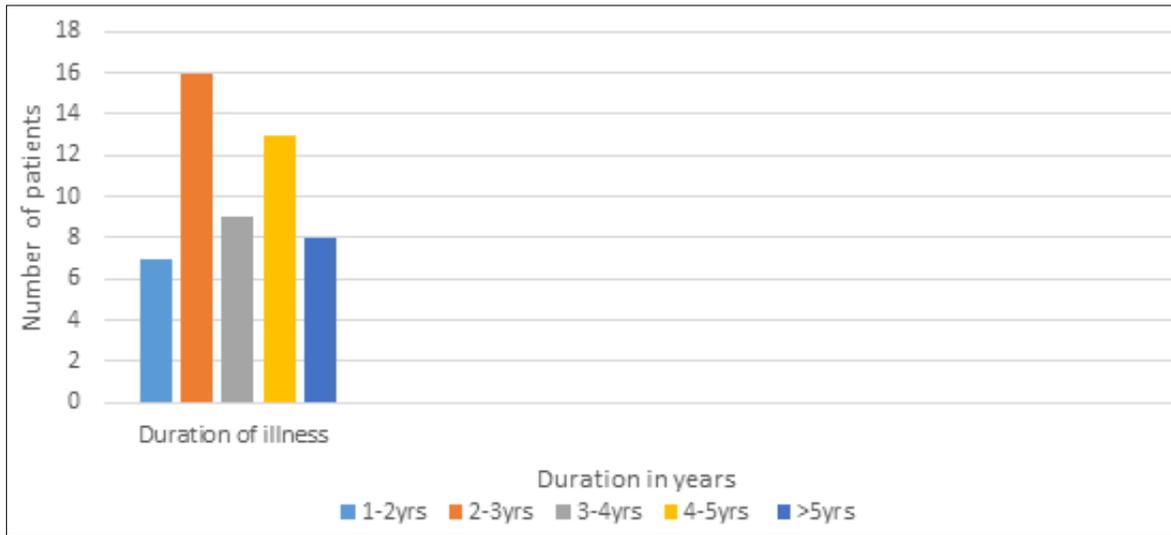


Figure 3. Pie diagram showing dietary status.

The age of onset of clinical presentation varied from 20-40 years and duration of illness from 1 year to 12 years (**Figure 4**).



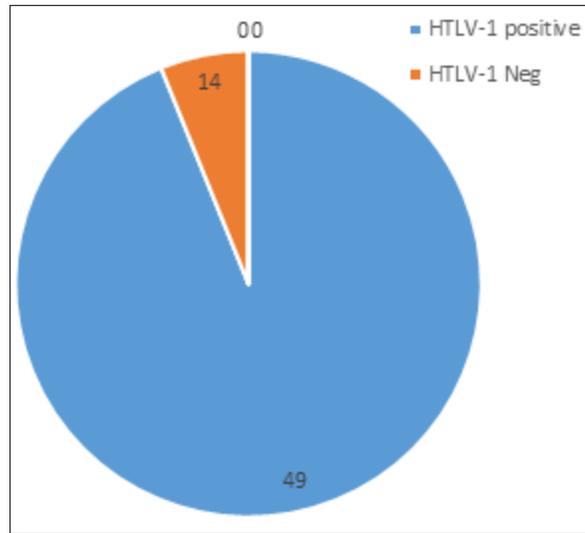
**Figure 4.** Bar diagram showing distribution of patients as per duration of illness.

Symptoms at the onset were difficulty in walking, stiffness of legs, back pain, weakness of legs, leg pain and urinary discomfort while presenting presentation at our center were disturbed gait, leg stiffness, back pain, leg pain urinary discomfort, urinary retention, tingling and numbness, erectile deficiency in male cases (**Table 2**).

**Table 2.** Showing 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               |

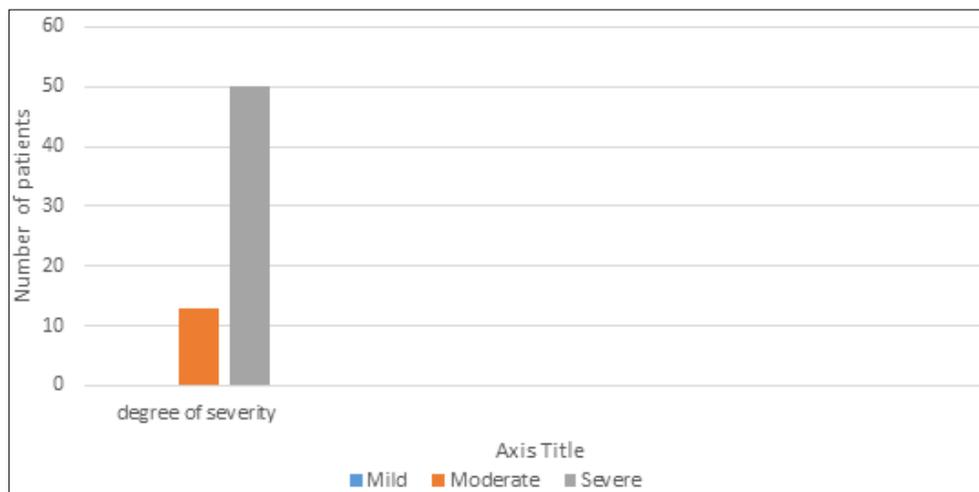
No history of blood transfusion, abortion, delivery or surgery prior to onset of the disease but serum samples revealed positive for HTLV-1 in 49 cases out of 63. In addition all the bio parameters (hepatic, hematological and renal profile remain normal) (**Figure 5**).



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

No patients were positive for tuberculosis, any sexually transmitted disease, CT and MRI also shows normal in all the cases.

Out of 63 patients 13 were of moderate and 50 were of severe status (**Figure 6**).



**Figure 6.** Bar diagram showing clinical severity.

Patients had taken treatment with  $\alpha$  interferon, muscle relaxants, neurovitamin supplementation at various medicare centers without any positive therapeutic outcome (**Table 3**).

**Table 3.** Showing treatments taken in past.

| Therapeutics taken          | Number of patients |
|-----------------------------|--------------------|
| Alpha interferon            | 43                 |
| Antiviral drug              | 49                 |
| Muscle relaxants            | 63                 |
| Neurovitamin supplement     | 63                 |
| Active and passive exercise | 63                 |

Symptomatic relief started from 4<sup>th</sup> week of therapy and by 24<sup>th</sup> week all had symptomatic relief (Figure 7).

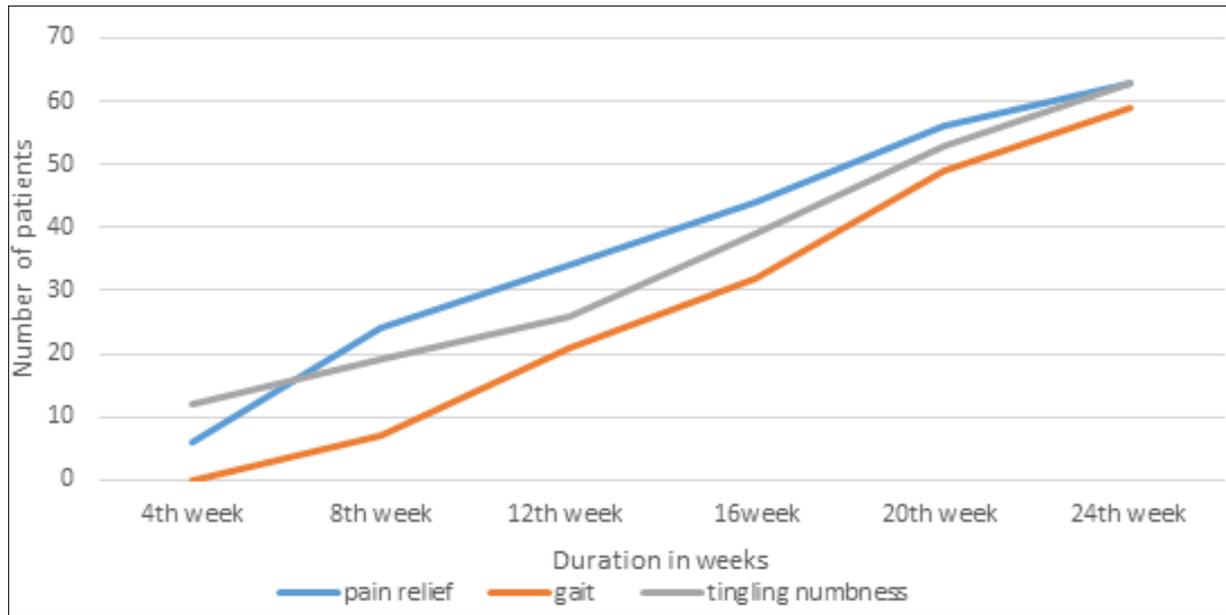


Figure 7. Graph showing duration required for improvement in presentation.

The minimum and maximum duration of therapy required for complete reversal of clinical presentation (both symptom and sign) is 9 months and 2 years, respectively.

Out of all 56 patients achieved Grade I clinical improvement and 7 Grade II (Figure 8).

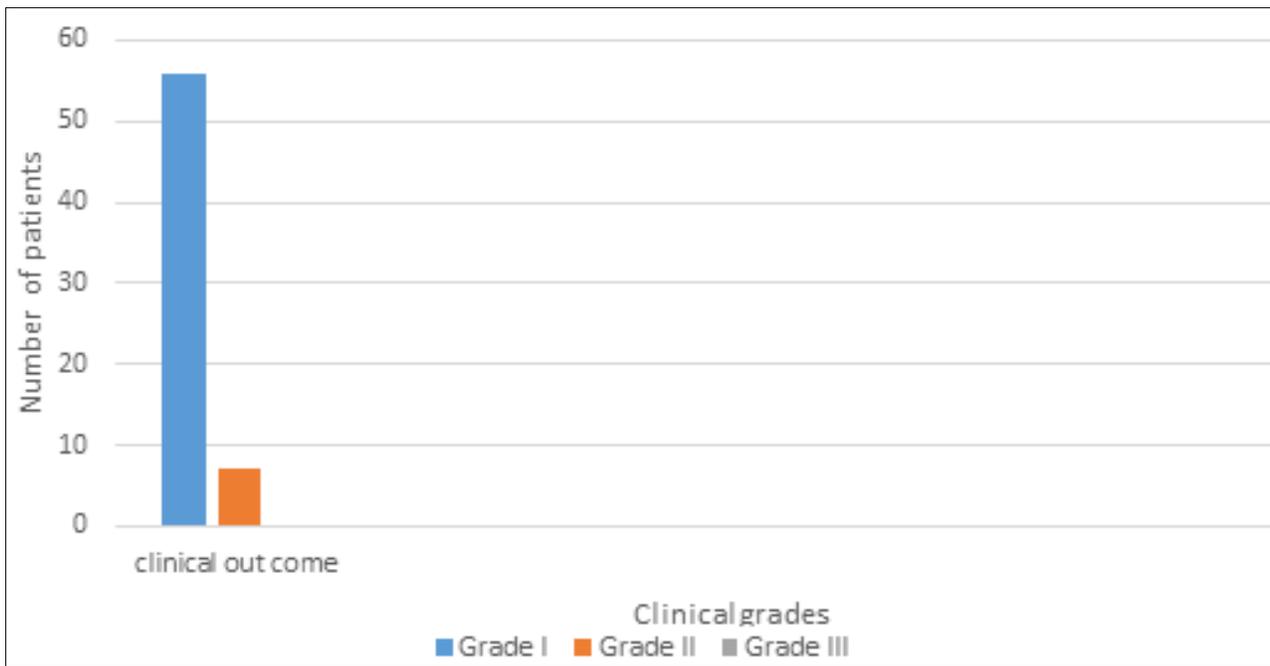


Figure 8. Bar diagram showing grades of clinical response.

No patients showed any adversity, recurrence of presentation or any alteration in bio parameters in 2 years of post-therapy follow up (Table 4).

**Table 4.** Showing outcome of the study.

| Particulars                | Number of patients |    |    |    |    |    |    |    |    |
|----------------------------|--------------------|----|----|----|----|----|----|----|----|
|                            | 1                  | 2  | 3  | 4  | 5  | 6  | 9  | 12 | 24 |
| Duration in months         | 1                  | 2  | 3  | 4  | 5  | 6  | 9  | 12 | 24 |
| 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 bioparameters |                    |    |    |    |    |    |    |    |    |
| Hepatic profile:           |                    |    |    |    |    |    |    |    |    |
| SGOT                       |                    |    |    |    |    |    |    |    |    |
| <35IU                      | 63                 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 |
| SGPT                       |                    |    |    |    |    |    |    |    |    |
| <35IU                      | 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 g%                     | 52                 | 58 | 59 | 63 | 63 | 63 | 63 | 63 | 63 |
| Clinical grade             |                    |    |    |    |    |    |    |    |    |
| Grade I                    |                    |    |    |    |    |    |    |    | 56 |
| Grade II                   |                    |    |    |    |    |    |    |    | 07 |
| Grade III                  |                    |    |    |    |    |    |    |    |    |

**DISCUSSION**

Tropical spastic para paresis is also common neurological disorder in India though it's a common in different parts of the world, i.e., including Jamaica, Martinique, Seychelles,

Colombia and Japan. Though it was considered as a neurological disorder of obscure etiology but these days it is proved to be caused by Human T Cell Lymphotropic virus type I (HTLV-I). In spite of advancement in diagnostics like CT, MRI, CSF and Serum for HTLV-I antigen [18,19], the

therapeutics used, i.e., alpha interferon, muscles relaxant and neurovitamin supplement [20-22] fails to ensure cure or improve quality of life except transient symptomatic relief. Clinical supremacy in term 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 as (Figure 9):

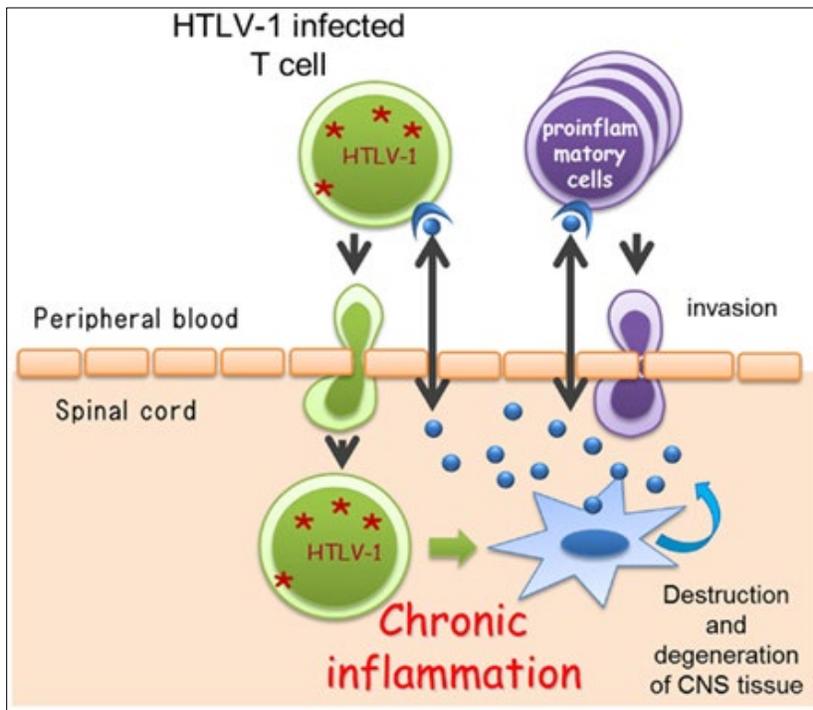


Figure 9. Pathogenesis caused due to HTLV-I infected T cells.

Considering its pathogenesis and caused due to HTLV-I infected T cells.

Self-blood with Betamethasone intramuscular induces antibody formation against the released toxin and ensure their neutralization while betamethasone acting as anti-inflammatory reduces neural edema synergized by intravenous calcium administration whose inclusion of one mole exit 2 mol of sodium acting on sodium potassium ATPase pump and facilitate decrease in neural edema and calcium ion improves neural conduction.

Methyl cobalamine, pyridoxine, niacin and pantothenic acid support neural cells in its normal neural conduction and Neurovit a herbal composite by its neurogenic activity helps in restoration of neural viability and vitality which combinely ensure relief in pain ,neuropathic manifestation ,gait and autonomic function and provide better quality of life to all.

**CONCLUSION**

Present regime constituting calcium gluconate intravenous, methyl cobalamine+Pyridoxin+Niacin intravenous, self-blood (2 ml) and Betamethasone 2 mg intramuscular, cap Cholecalciferol 60 K, syrup herbal neurotonic (Neurovit)

proves worth in management of tropical spastic para paresis even in chronic and long term treated cases.

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