

Integrative Medicine Enhances Motor and Sensory Recovery in Guillain–Barre Syndrome – A Case Study

Abstract

Guillain–Barre syndrome (GBS) is a heterogenous group of immune-mediated conditions affecting peripheral nerves. About 40% of patients treated with standard dosage of plasma exchange or intravenous immunoglobulins do not improve in the first 4 weeks following treatment. Add-on treatment from traditional medical approaches such as Yoga therapy and Ayurveda are increasingly being sought for rehabilitation of patients with chronic neurological disorders. The current case study reports the clinical utility of adjunct Yoga and Ayurveda treatment in the treatment of residual symptoms of GBS.

Keywords: *Ayurveda, Guillain–Barre syndrome, panchakarma, yoga*

Introduction

Guillain–Barre syndrome (GBS) is a heterogenous group of immune-mediated polyradiculoneuropathy causing rapidly progressive limb weakness. The incidence of GBS is 0.5–2/100,000/year, with a risk of <1 in 1000 over the lifetime of an individual.^[1] Clinically, GBS progresses over a period of time, beginning with numbness and weakness over lower extremities.^[2] Around 50% of patients develop maximum weakness by 2nd week, 80% by 3rd week, and 90% by the end of 4th week.^[3] Proven therapies are intravenous immunoglobulins and plasma exchange, which have been shown to be efficacious in the management of GBS.^[4] However, significant number of patients report sensory-motor residual symptoms that persist for a long time (ranging from 6 months to 3 years) in spite of following all conventional treatment approaches.^[5] These residual symptoms significantly affect functionality and quality of life of the patient.^[6] Thus, the present case report aims at providing preliminary evidence toward utility of integrative medicine (IMD) (combining conventional treatment modalities with traditional Indian systems of medicine, namely Yoga and Ayurveda) in managing residual sensorimotor symptoms in a patient with GB syndrome.

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Case Report

A 70-year-old male patient who was wheelchair bound (with knee gaiters and artificial foot orthoses [AFO] for knee and foot support) visited the outpatient department (OPD) of IMD, NIMHANS with the complaints of weakness in both the lower limbs and difficulty in walking, burning sensation and numbness in lower limbs for 5 months, and difficulty in holding objects in both hands for the past 4 months.

The patient was relatively alright 5 months back when he started complaining of sudden onset numbness and cold sensation over distal aspects of both the lower limbs. The symptoms started progressing proximally within a day and involved the upper limbs as well in the next 2 days. From 3rd day, the patient started developing difficulty in walking, buckling of the knees and noticed slipping of the footwear while trying to walk. He also noticed difficulty in gripping objects and combing his hair at the same time. By the 5th day of onset of symptoms, the patient was bed-ridden and became dependent on his family for all activities of daily living (ADL). The patient provided a history of taking the first dose of vaccination for COVID-19 infection (Covishield vaccine) 19 days before the onset of symptoms.

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As the symptom's worsened, the patient was admitted to a tertiary care private hospital (5th day postsymptoms onset) after testing him for COVID-19 infection (reverse transcription-polymerase chain reaction [RT-PCR] test was negative). There was no history of fever, diarrhea, swallowing or speech disturbances, respiratory distress, or bowel bladder incontinence. Diagnosis of GBS was made based on cerebrospinal fluid analysis which showed albuminous cytological dissociation and nerve conduction study (NCS) suggestive of demyelinating polyneuropathy. After 5 days of admission, although the patient started showing improvement in power of upper limbs and anti-gravity muscles of the lower limb, he started developing symptoms of cough with expectoration and fever. His RT-PCR report for COVID-19 infection came out to be positive. The patient was managed as per the guidelines and stabilized and was discharged after 10 days of admission. Three days postdischarge patient tested negative for COVID-19 infection.

Later, after 10 days postdischarge, the patient again developed symptoms of cough with expectoration, difficulty in swallowing for liquids and solids, and speech difficulty. Within a day, he experienced weakness and numbness in all four limbs similar to the previous episode of GBS and was readmitted to the same private tertiary care hospital as before. He was diagnosed with left vocal cord paralysis by an ENT surgeon. Later, the patient started receiving feeds through nasogastric tube and was referred to NIMHANS, Bengaluru for further management.

The very next day, the patient was admitted at NIMHANS, a diagnosis of recurrent GBS was made, and the patient was managed with seven cycles of large volume plasmapheresis (LVPP). At this time, he was unable to indicate bowel bladder movements and was on diaper and condom catheter. After 4 days of admission, the patient developed severe respiratory distress and was put on mechanical ventilation. Gradually, he was weaned off ventilator support in the next 20 days of hospitalization. The patient started taking oral feeds in the next 7 days. Further, after five cycles of LVPP, the patient started to notice recovery in motor power in the form of anti-gravity movements of all the four extremities. Supportive treatment including symptomatic treatment for pain, anti-hypertensives, deep vein thrombosis prophylaxis, and antibiotics was given. Inputs from the departments of neuro-rehabilitation, psychiatric social work and speech and audiology were also taken. The patient showed improvement in motor and bulbar symptoms. The patient was discharged and was advised to undergo neuro-rehabilitation practices including physiotherapy.

After this, within a week of discharge, the patient was admitted under the Department of Neuro-rehabilitation and underwent physiotherapy for the next 30 days and was advised bilateral knee gaiters and AFO to

aid walking. With physiotherapy, the patient showed improvement in hand grip strength, he was able to stand with support and AFO and was able to walk few steps with the help of a walker. However, the patient still complained of easy fatiguability, paraesthesia and difficulty in feeling the floor on bare feet, and weakness in the lower limbs at the time of discharge (after 45 days of treatment in neuro-rehabilitation). He was advised to continue physiotherapy practices postdischarge at home. However, the patient did not report further improvement in neurological deficits and sensory symptoms even after 30 days of physiotherapy practice at home.

In this condition, the patient and his family decided to explore Integrative therapies of yoga and Ayurveda and visited the OPD services of the Department of IMD, NIMHANS. It was decided to admit the patient and one caretaker (his son) to the in-patient services of IMD.

Clinical findings and diagnostic assessments

Chief complaints at the time of admission were burning sensation over both the lower extremities, numbness in distal part of both the lower extremities and inability to feel the floor on bare feet, weakness in arms, and difficulty in walking. Examination of sensory system revealed abnormalities in superficial touch, pain, temperature, two-point discrimination, and joint position sense. Examination of motor system revealed diplegic presentation of lower extremities and para-paresis like presentation in upper extremities. Power was 1/5 in both lower extremities and it was 4/5 in both upper extremities. Hypertonia was observed in both the upper and lower extremities, and deep tendon reflexes were absent. There was no wasting of the muscles. Among the test for coordination, the patient was able to perform finger-nose test, whereas he was unable to perform heel shin test and tandem walking. Cranial nerve examination revealed no abnormality. Prefunctional Ambulation Profile Score showed impairment in gait. NCS showed reduced velocity in Rt. Median and Rt. Ulnar nerve.

Integrative therapeutic intervention

The patient continued to follow all conventional medicine advices and medications as prescribed by the neurologist (Tab. Terol LA 2 mg HS, Tab. Optineuron 1OD, Tab. Maxgalin-NT 1BD, Tab. Calinept 1OD) including physiotherapy practices. As an add-on to the above, a lifestyle regimen of integrative yoga and ayurveda management was added. Based on presenting symptoms, a diagnosis of *Sarvangavata*^[7] with *avarana* pathology involving *kapha*, *vyana*,^[8] and *udana vata*^[9] was considered. Details of IMD treatment are provided below,

Ayurveda Therapy

Systematic Panchakarma (Ayurveda-based herbal detoxification) procedure of 23 days was performed. Tables 1 and 2 provide the treatment details.

Yoga module

Daily supervised sessions of yoga (50 min per day) 6 days a week were conducted for 18 days followed by home practice with an objective of improving balance, muscle strength, and sensory symptoms. Home practice was continued with the help of Tele-yoga and shared video. Table 3 provides the details of the Yoga intervention.

Follow-up and outcomes

Subject was assessed at time points-baseline, 18th day of admission, and 30 days postdischarge. During discharge, sensory deficits showed full recovery in terms of superficial touch, pain and temperature from 10 to 2 assessed using visual analog scale. Muscle power of upper limbs improved from 4/5 and 1/5 to 5/5 and 4/5 in upper and lower extremities, respectively. The patient was able to walk without AFO or any support for a distance of 50 m without fatigue. NCS showed mild improvement in conduction velocity in Rt. Median Nerve (from 17.2 meter/s to 19 meter/s) and Rt. Ulnar Nerve (from 24.7 meter/s to 26.1 meter/s),

respectively [Table 6]. There was an accompanying improvement in the performance of ADLs and other criteria as revealed from the scales applied on the day of admission, day of discharge, and first follow-up after a month. Improvements were also observed in muscle strength and ADL [Tables 4 and 5]. Balance index showed reduction in fall risk [Figure 1 fall risk test], whereas the overall stability index and overall sway index improved by 72% and 78%, respectively, along with an improvement in sensory integration of balance by 29% [Table 5-postural stability progress report and Figure 2-clinical test of sensory integration of balance]. The above-mentioned improvements sustained at 30-day postdischarge [Tables 4-6].

Discussion

GBS bears close resemblance with *Sarvangha vata* which is included under *Vata Vyadhi*.^[10] The general line of treatment of *vata vyadhi*; *Snehana*, *Swedana*, *Asthapana*, *Anuvasana* was adopted in the patient. *Sarvangha dhara* with *Dhanyamla* has shown to have

Table 1: Panchakarma intervention

Treatment	Procedures	Duration
<i>Rookshana Chikitsa</i> (drying therapy) - aims to remove <i>avarana</i> caused by <i>kapha</i> dosha	<i>Utsadana</i> (powder massage mixed with oil) with <i>Kolakulattadi churna</i> mixed with warm <i>Karpasyadi Taila</i> <i>Sarvangha dhara</i> (synchronous pouring of medicated liquid over whole body at a constant temperature) with <i>Dhanyamla</i>	7 days (5 days on outpatient and rest on inpatient basis)
<i>Vatahara Chikitsa</i> (measures to restore normal <i>vata</i> activity)	<i>Shashtika shali pinda sweda</i> (application rice poultice) <i>Basti</i> (therapeutic enema) - <i>Madhutilika niruha vasti</i> and <i>Sahacharadi taila anuvasana vasti</i>	8 days total 8 <i>basti</i> given in <i>yoga basti</i> pattern
<i>Brimhana Chikitsa</i> (measures to restore strength)	<i>Shashtika shali pinda sweda</i> (application rice poultice) <i>Basti</i> (therapeutic enema) - <i>Mustadi yapana niruha vasti</i> and <i>Bala ashwagandhadi taila anuvasana vasti</i>	8 days total 8 <i>basti</i> given in <i>yoga basti</i> pattern

Table 2: Ayurveda medications

Name of the drug	Dose	Anupana (Adjuvant)	Duration (days)
<i>Sahacharadi Kashaya</i>	15 ml thrice before food	45 ml warm water	45
<i>Sahacharadi Taila 21 Avarti</i>	10 drops thrice	Along with <i>Kashaya</i>	45
<i>Rasaraja Rasa</i>	1 tablet twice	Warm water	45

Table 3: Yoga module

Practices	Duration (min)
<i>Sukshma Vyayama</i> (whole body loosening)	5
<i>Shakti-Vikasaka</i> (muscle strengthening yogic practices at all major joints) with wall support	5
Hands in and out breathing	2
Hands stretch breathing	2
<i>Trikonasa</i> (triangle pose) breathing with wall support	3
Straight leg raise breathing at the edge of the bed (with active support initially)	8
Deep abdominal breathing in <i>Shavasana</i>	5
<i>Nadishuddhi Pranayama</i> (alternate nostril breathing)	5
<i>Bhramari Pranayama</i> (humming breath)	5
<i>Nadanusandhana</i> (mind sound resonance with sounds, aa, uu, and mm 9 rounds each) in with deep relaxation of muscles	10
<i>Shavasana</i>	

Table 4: Assessment of functional index

Scale	Pre (August 16, 2021)	Post (September 3, 2021)	Follow-up (October 10, 2021)
Barthel index	35	77.5	100
Functional independence measure	73	109	126
Fatigue severity scale	51	15	9
Visual analog fatigue scale	2	8	10
GBS disability score	4	2	0
Overall neuropathy limitations scale	8	4	0

GBS=Guillain-Barre syndrome


Table 5: Balance index

Test	August 26, 2021	September 1, 2021	October 12, 2021
CTSIB (sway index-composite score average)	6.01	-	4.26
Fall risk (composite score-Z score)	4.67	-	3.46
Limit of stability (composite score average) (%)	-	117	155
Postural stability (overall)	-		
St. I		4.02	0.92
Sw. I		3.78	0.83

CTSIB=Clinical Test of Sensory Interaction and Balance, St. I=Stability index, Sw. I=Sway index

Fall Risk Test Progress Report

Fall Risk Test



PATIENT INFORMATION
 Patient Name : [Redacted]
 Patient ID : [Redacted]
 Age : 70
 Height (cm) : 158
 Gender : Male

TEST SUMMARY
 Date Range : [Redacted]

Legend	Condition	26-08	12-10
—	Eyes Open Narrow	21.23	15.27
—	Eyes Closed Narrow	25.18	24.06
—	Composite	22.54	19.67

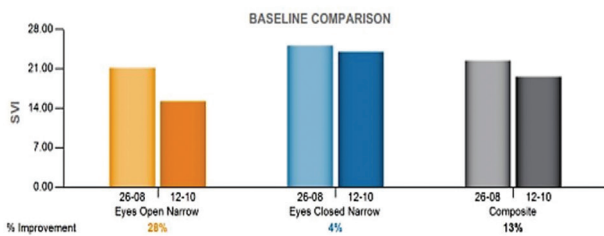
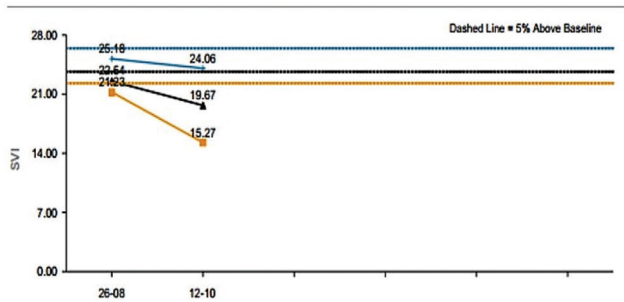



Figure 1: Fall risk Test

anti-oxidant and anti-inflammatory action.^[11] *Basti* is considered as the best treatment for *Vata Vyadhi*. It helps in achieving *Vatanulomana* (downward regulation

CTSIB Progress Report

Clinical Test of Sensory Integration of Balance



PATIENT INFORMATION
 Patient Name : [Redacted]
 Patient ID : [Redacted]
 Age : 70
 Height (cm) : 158
 Gender : Male

TEST SUMMARY
 Date Range : [Redacted]

Legend	Condition	26-08	12-10
—	Composite	6.01	4.26

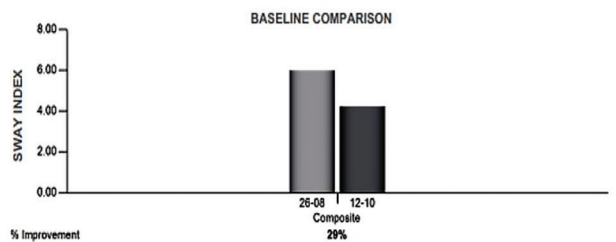
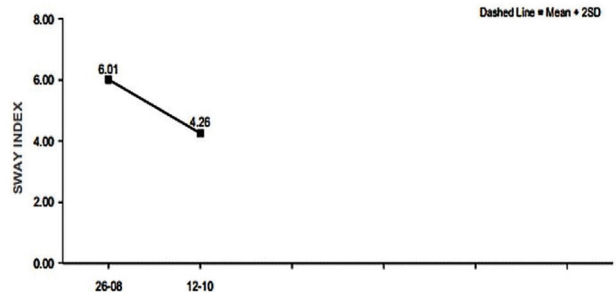


Figure 2: Clinical Test of Sensory Integration of Balance

of vata) and *Sroto shuddi* (Clearing the channels) and it is the choice of treatment for disease afflicting the *Madhyama Roga Marga* (Disease affecting vital organs).

Table 6: Nerve conduction study

Nerve conduction study	Velocity (m/s)	Velocity (m/s)
Right median nerve	17.2	19.0
Right ulnar nerve	24.7	26.1

Studies suggest improvement in ADL,^[12] enhanced vagal activity^[13] and changes in gut microbiome post *Basti chikitsa*.^[14] *Shashtika shali pinda sweda* in various neurological conditions suggests improvement in motor deficits post, ADL, has nourishing effect on muscles, and peripheral nerves.^[15]

Further, studies show persistence of sensory and motor deficits postconventional therapy significantly affect functionality and quality of life of the GBS patients. Case reports on Ayurveda^[10] in GBS and randomized control trial on Yoga^[16] as add-on in GBS demonstrate significant improvement in motor and sensory deficits, reduction in pain, anxiety, depression score, and overall improvement in functional status. The current case report highlights the role of Integrative Ayurveda and Yoga therapy as an add-on to conventional care in improving overall functional status of GBS patient. At present, with limited evidence, we are not in position to comment on whether only Yoga and Ayurveda without conventional care would achieve such outcomes. We highlight the importance of integrative approach for the well-being of the patient.

Conclusion

Combining conventional pharmacological treatment approaches, neuro-rehabilitation (including physiotherapy), speech pathology, and audiology along with the traditional medicine of Yoga and Ayurveda may produce a synergistic effect. Integrated Ayurveda and Yoga-based lifestyle regimen may particularly be useful in improving residual sensory-motor deficits in patients with chronic neurological sequelae of GBS. This should be explored further through systematic trials.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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