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From Acute Paralysis to Functional Recovery: Rehabilitating Guillain-Barré Syndrome – A Case Study

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ABSTRACT

Background: The symptoms of Guillain-Barré Syndrome (GBS), an acute immune-mediated polyradiculoneuropathy, include symmetrical weakness that develops quickly and decreased or absent deep tendon reflexes. Acute Inflammatory Demyelinating Polyneuropathy (AIDP), the most prevalent subtype, mainly attacks peripheral nerve myelin, resulting in severe motor and sensory deficits as well as respiratory compromise that need critical care management.

Case Description: This case study describes a young female diagnosed with the AIDP variant of GBS who presented with acute onset ascending paralysis, sensory disturbances, hypotonia and areflexia. On admission to the Intensive Care Unit (ICU), assessment revealed reduced muscle strength (Medical Research Council grading), impaired superficial sensation, decreased trunk control, and dependence in functional activities including bed mobility and transfers. Continuous monitoring of respiratory function and vital parameters was performed due to the risk of rapid clinical deterioration.

Intervention: In order to prevent subsequent problems and promote neurological recovery, early PT intervention was started in the intensive care unit. Positioning, passive range of motion exercises, chest physical therapy, breathing exercises, and sensory stimulation were all part of the rehabilitation regimen. Active-assisted exercises, bed mobility training, and facilitation approaches were used to improve motor recovery and functional independence as the patient's condition improved.

Outcome and Follow-Up: Early physical therapy intervention was initiated in the intensive care unit to prevent further issues and encourage neurological recovery. The rehabilitation program included breathing exercises, passive range of motion exercises, chest physical therapy, positioning, and sensory stimulation. As the patient's condition improved, active-assisted exercises, bed mobility training, and facilitation techniques were employed to enhance motor recovery and functional independence.

Conclusion: Early and structured physiotherapy management plays a vital role in the rehabilitation of patients with the AIDP variant of GBS. A 2-week ICU-based rehabilitation program can contribute to significant improvements in respiratory function, motor recovery, and early functional independence.

Keywords: Guillain-Barré Syndrome, AIDP, ICU rehabilitation, physiotherapy, neural recovery.

Introduction

Guillain-Barré Syndrome (GBS) is characterized by an acute autoimmune inflammatory response that is typically triggered by a previous infection. This reaction causes peripheral and autonomic neurons to

demyelinate, which accelerates the development of sensory and motor dysfunction [1]. Guillain, Barré, and Strohl identified a distinct clinical condition characterized by a sudden onset of limb weakness, loss of tendon reflexes, and elevated CSF fluid protein with a normal cell count. The syndrome is heterogeneous, according to later clinical, neurophysiological, and pathological research. The pathophysiology of axonal and demyelinating subtypes has been studied in more sophisticated pathological and immunological investigations. Collaborations at the national and later worldwide levels have sped up the process of defining and forecasting the course of the disease as well as identifying the infections that trigger it. Management criteria have been agreed upon by an international consensus group. Effective medicines have been found through multicenter trials, and pharmaceutical corporations are finally showing interest. This review makes recommendations for future research directions based on the history of GBS research [2]. The incidence of typical GBS has been reported to be relatively uniform between 0.6 and 4 cases per 100,000 per year throughout the world. A nonspecific infection of any kind has been recorded to precede GBS, typically a few weeks before to the development of neurological symptoms; trauma, surgery, or vaccination are other potential triggers.The primary underlying pathophysiology of the illness is multifocal segmental demyelination.

GBS can be divided into a number of subtypes based on pathologic, electrophysiologic, etiologic, and clinical characteristics. These include Miller Fisher syndrome (MFS), axonal variants of GBS, such as acute motor-sensory axonal neuropathy (AMSAN) and acute motor axonal neuropathy (AMAN), and acute inflammatory demyelinating polyradiculoneuropathy (AIDP) [3]. Because it promotes functional recovery and lessens issues that may result from extended immobility, physiotherapy is crucial for controlling GBS. As the patient progresses through the stages of the disease, physiotherapy aims to maintain joint mobility, avoid contractures, and increase muscular strength. In order to optimize results and offer complete patient care, physiotherapy is essential during the acute, plateau, and recovery phases of GBS. This case study examines the physiotherapy treatment of a patient in Greater Noida who has been diagnosed with Guillain-Barré Syndrome (GBS) of the acute inflammatory demyelinating polyneuropathy (AIDP) type.

settings. The article adds to the scant literature on GBS management by concentrating on the therapeutic approaches employed, the challenges encountered, and the results obtained. This illustration emphasizes the necessity of prompt and consistent physiotherapy intervention in the all-encompassing treatment of GBS, encouraging the need for more structured and situation-specific approaches in settings with limited resources [4].

Millions of people's lives have been severely impacted by the pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which was initially identified in Wuhan, China. The virus that causes coronavirus disease 2019 (COVID-19) primarily affects the respiratory system, with symptoms ranging from a minor upper respiratory tract infection to severe acute respiratory distress syndrome and septic shock, in addition to a variety of neurological symptoms. A demyelinating manifestation has not been frequently described, despite numerous instances of thrombotic symptoms affecting the nervous system [5].

The illness frequently develops 14 days after an infection. Ascending muscle paralysis, sensory abnormalities, and autonomic dysfunction are examples of neurological symptoms. Campylobacter jejuni, cytomegalovirus, Mycoplasma pneumoniae, Epstein-Barr virus, and influenza virus are among the causal organisms that have been linked to GBS patients in the past. The list now includes SARS-CoV-2 infection as a prior disease to GBS. Here, we describe a case of GBS in a patient who came to our emergency room

with a history of COVID-19 infection and contrast the results with other reports in the literature. Examining the degree of correlation between COVID-19 and GBS was the aim of the literature review [6].

Case Presentation

A 27-year-old female presented to Sharda Hospital, with complaints of tingling and numbness in both feet, which later progressed to involve the hands over a period of 20 days. This was followed by gradually progressive, symmetrical weakness in both lower limbs, which ascended to involve the upper limbs over the next 18 days. The patient also reported difficulty in standing and walking without support and impairment in fine motor activities, such as holding objects and tying clothing strings, for the past 15 days. The patient was apparently in her usual state of health prior to the onset of symptoms. She gave a history of sore throat and cough approximately two weeks before the onset of neurological symptoms, suggestive of an upper respiratory tract infection, which resolved spontaneously. The illness began with insidious onset tingling in both feet, which progressed in an ascending manner to involve the lower limbs and subsequently the upper limbs. This was followed by the development of symmetrical motor weakness along with a sensation of tightness and mild aching in the limbs. Despite self-medication, there was no relief, and symptoms continued to worsen, leading to functional limitations.

Due to progression of symptoms, the patient was initially admitted to a hospital in Faridabad on 10th July. During hospitalization, she developed bilateral lower motor neuron facial weakness, characterized by difficulty in closing her eyes and puffing her cheeks. This facial weakness gradually improved and had completely resolved by the time of the present assessment. There was no history of bowel or bladder involvement, respiratory distress, or autonomic dysfunction. The patient had no prior history of similar neurological illness, diabetes mellitus, hypertension, thyroid disorders, tuberculosis, or recent diarrheal illness. There was no history of trauma, surgery, or COVID-19 infection. Personal and family histories were non-contributory, with no history of substance abuse or hereditary neurological disorders.

At the time of admission on 19th July 2025, the patient was conscious, cooperative, and hemodynamically stable.

Following hospital admission on 19th July 2025, a detailed clinical examination and investigations were performed. Lumbar puncture findings revealed markedly elevated cerebrospinal fluid (CSF) protein levels (461 mg/dl) with relatively normal glucose levels (97 mg/dl), indicating albuminocytologic dissociation, a hallmark feature of Guillain-Barré Syndrome (GBS).

Further evaluation using nerve conduction velocity (NCV) studies demonstrated prolonged distal latencies and significantly reduced conduction velocities, while compound muscle action potential (CMAP) amplitudes were relatively preserved. These findings were consistent with acute inflammatory demyelinating polyradiculoneuropathy (AIDP), the most common subtype of GBS.

The patient received intravenous immunoglobulin (IVIG) therapy as part of medical management. Physiotherapy rehabilitation was initiated on 24th July 2025 following clinical assessment, aiming to improve functional mobility, muscle strength, and overall independence.

Timeline of Events

- Date of admission: 19th July 2025
- Date of assessment: 24th July 2025
- Date of physiotherapy rehabilitation initiation: 24th July 2025

- Medical management: IVIG therapy administer each during hospital stay
- Date of Post assessment: 7th August 2025

Clinical Findings

The patient was conscious, cooperative, and well oriented to time, place, and person, with a Glasgow Coma Scale (GCS) score of E4, V5, M6. She was afebrile and hemodynamically stable at the time of examination. On general observation, the patient exhibited a mesomorphic body build. The attitude of the limbs revealed upper limbs positioned in semi-flexion at the elbows with forearms pronated, while the lower limbs were maintained in slight flexion at the hips and knees with ankles in a neutral position. The patient was observed in a supine position on the ICU bed, with the head supported by a pillow and limbs placed in mild abduction at the shoulders along with slight flexion at the elbows and knees, indicating a position of comfort.

Gait assessment was not performed as the patient was non-ambulatory and admitted to the ICU due to significant weakness. The respiratory pattern was thoracoabdominal in nature with a regular rate and no observable use of accessory muscles, suggesting relatively preserved respiratory mechanics at rest. There was no evident muscle wasting on inspection. Additionally, skin examination revealed no signs of pressure sores, with intact skin over common pressure areas including the sacrum, heels, and elbows.

On neurological examination, both superficial and deep tendon reflexes were found to be diminished in bilateral upper and lower limbs (Table 1). Muscle tone, assessed using the tone grading scale, was reduced in both upper and lower limbs (Table 2). Manual Muscle Testing (MMT) revealed reduced muscle strength in bilateral upper and lower limbs, with more pronounced weakness in the lower limbs (Table 3). Grip strength was also reduced bilaterally, affecting fine motor activities.

Coordination and equilibrium assessment demonstrated mild to moderate impairment, particularly in lower limb rapid alternating movements and tasks requiring fine motor control, while equilibrium was severely affected, with the patient unable to maintain independent standing or perform dynamic balance activities (Table 4). Functional balance assessment revealed that the patient could maintain static sitting with constant upper limb support but exhibited trunk sway during dynamic sitting tasks and was unable to safely perform static or dynamic standing activities (Table 5).

Functional independence, assessed using the Functional Independence Measure (FIM), indicated significant dependence in motor domains, especially in transfers and locomotion, while cognitive and communication functions were fully preserved (Table 6).

Hand function assessment showed that reaching was possible but slow and weak, primarily limited by proximal muscle weakness. Grasping was achievable with reduced grip strength; however, the patient was unable to sustain hold for prolonged periods. Releasing was present but delayed, with slow finger extension following grasp.

Sensory examination revealed altered sensations in the form of tingling and numbness in a glove and stocking distribution involving both upper and lower limbs. However, crude touch and proprioception were relatively preserved. Pain assessment using the Numerical Pain Rating Scale (NPRS) showed a score of 4/10 at rest and 6/10 on movement of the lower limbs.

Cranial nerve examination revealed no deficits at the time of current assessment, although there was a prior history of bilateral lower motor neuron facial weakness during earlier hospitalization, which had completely resolved.

On observation, there was no evidence of muscle wasting, pressure sores, deformities, or open wounds. Intravenous access was present in the left forearm, and a urinary catheter was in situ.
On palpation, there was no tenderness or edema in any of the four limbs.

Table 1.
Variation in reflexes grading.

Reflex	Right Side	Left Side
Superficial Reflexes	+1	+1
Plantar	Flexor Plantar Reflex	Flexor Plantar Reflex
Abdominal	+1	+1
Deep Tendon Reflexes		
Biceps	+1	+1
Triceps	+1	+1
Supinator	+1	+1
Knee (Patellar)	0	0
Ankle (Achilles)/	0	0

0: absent, 1 +: present but depressed, 2 +: brisk response; normal, 3 +: exaggerated, 4 +: clonus always abnormal.

Table 2.
Variation in Muscle Tone (TGS).

Muscle Group	Right Side	Left Side
Shoulder Flexors	1+	1+
Shoulder Extensors	1+	1+
Shoulder Abductors	1+	1+
Shoulder Internal Rotators	1+	1+
Shoulder External Rotators	1+	1+
Elbow Flexors	1+	1+
Elbow Extensors	1+	1+
Wrist Flexors	1+	1+
Wrist Extensors	1+	1+
Hip Flexors	1+	1+
Hip Extensors	1+	1+
Knee Flexors	1+	1+
Knee Extensors	1+	1+
Ankle Dorsiflexors	1+	1+
Ankle Plantar flexors	1+	1+

Tone Grading System (TGS): 0: no increase in tone, 1+: decrease tone, 2+: normal tone, 3+: increase tone.

Table 3.
Variation in muscle strength (MMT)

Muscle Groups	Right Side	Left Side
Shoulder Flexors	3/5	3/5
Shoulder Extensors	3/5	3/5
Shoulder Abductors	3/5	3/5
Shoulder Internal Rotators	3/5	3/5
Shoulder External Rotators	3/5	3/5
Elbow Flexors	3/5	3/5
Elbow Extensors	3/5	3/5
Wrist Flexors	2/5	2/5
Wrist Extensors	2/5	2/5
Hip Flexors	3/5	3/5
Hip Extensors	3/5	3/5
Hip Abductors	3/5	3/5
Hip Internal Rotators	3/5	3/5
Hip External Rotators	3/5	3/5
Knee Flexors	3/5	3/5
Knee Extensors	3/5	3/5
Ankle Dorsiflexors	2/5	2/5
Ankle Plantar Flexor	2/5	2/5

0: no contraction, 1: flickering contraction, 2: full range of motion (ROM) with gravity eliminated plane, 3+: full range of motion against gravity, 4+: full range of motion against a gravity moderate resistance, 5: full range against gravity, maximum resistance.

Table 4.1.
Coordination and Equilibrium Assessment

Test	Right	Left	Observation
Finger to Nose	4	4	Near Normal Coordination
Finger Opposition	4	4	Adequate Fine Motor Control
Pronation/Supination	4	4	Mildly affected rhythm
Rebound Test	3	3	Delayed Response
Hand Tapping	4	4	Slight reduction in speed
Foot Tapping	2	2	Markedly reduced
Heel to knee	4	4	Performed with mild difficulty
Drawing a circle	2	2	Impaired smoothness

Table 4.2.

Test	Grade	Observation
Standing – Normal Posture	1	Unable to maintain Independently
Standing – Eyes Closed	1	Poor Balance
Standing – Feet Together	1	Instability present
Single limb Standing	1	Unable to perform
Tandem Walking	1	Not Possible
Sideways Walking	1	Not Possible
Backward Walking	1	Not Possible
Walking on Heels	1	Not Possible

Table 5.
Functional Balance Assessment

Balance Type	Test	Remarks
Static Sitting	Sitting unsupported for 30 secs	Ables to maintain sitting but required constant upper limb support
Dynamic Sitting	Reaching within base of support	Able to reach within limited range, trunk sway present
Static Standing	Standing with support	Unable to perform safely
Dynamic Standing	Weight shifting with support	Unable to perform safely

Table 6.
Functional Independence Measure (FIM) Assessment

Domain	Item	Score (1-7)	Remarks
Self Care	Eating	5	Require setup assistance due to weak grip
	Grooming	4	Requires minimal assistance
	Bathing	3	Requires moderate assistance
	Dressing-Upper Body	4	Requires minimal assistance
	Dressing-Lower Body	3	Requires moderate assistance
	Toileting	3	Requires moderate assistance
Sphincter Control	Bladder	6	Modified Independence

	Bowel	6	Modified Independence
Transfers	Bed/Chair/Wheelchair	3	Moderate assistance required
	Toilet	3	Moderate assistance required
	Tub/Shower	2	Maximal assistance required
Locomotion	Walking	1	Total assistance
	Stairs/Wheelchair	1	Total assistance
Communication	Comprehension	7	Independent
	Expression	7	Independent
Social Cognition	Social Interaction	7	Independent
	Problem Solving	7	Independent
	Memory	7	Independent

- Total FIM Score: 79 / 126
- Motor FIM: 44 / 91
- Cognitive FIM: 35 / 35

Diagnostic Assessment:

The diagnosis was proved based on clinical presentation, electrophysiological findings, and cerebrospinal fluid (CSF) analysis. The patient presented with acute onset, progressive, symmetrical limb weakness and reduced functional mobility, suggestive of a peripheral neuropathic process. Nerve conduction studies revealed prolonged distal latencies and markedly reduced conduction velocities with relatively preserved compound muscle action potential (CMAP) amplitudes. Additionally, F-wave abnormalities and temporal dispersion showed proximal nerve involvement and segmental demyelination.

CSF analysis obtained via lumbar puncture demonstrated significantly elevated protein levels (461 mg/dL) with normal glucose levels and no corresponding increase in cell count, indicative of albuminocytologic dissociation. This finding is characteristic and typically observed after the first week of onset in Guillain-Barré Syndrome.

The combined clinical, electrophysiological, and CSF findings confirmed a diagnosis of acute inflammatory demyelinating polyradiculoneuropathy (AIDP). Differential diagnoses, including axonal variants of Guillain-Barré Syndrome and other causes of acute flaccid paralysis, were considered; however, the predominant demyelinating pattern on nerve conduction studies along with characteristic CSF findings supported the final diagnosis.

Table 7.
NCV Results

Parameter	Upper Limb Nerves (Median/Ulnar)	Lower Limb Nerves (Peroneal/Tibial)	Interpretation
Distal Latency	Prolonged	Prolonged	Suggestive of demyelination

Conduction Velocity	Markedly Reduced	Markedly Reduced	Slowed impulse transmission
CMAP Amplitude	Relatively Preserved/mildly reduced	Relatively Preserved/mildly reduced	Axonal integrity relatively maintained
F-wave Latency	Prolonged/absent	Prolonged/absent	Proximal nerve Involvement
Temporal Dispersion	Present	Present	Non-uniform conduction
Conduction Block	May be present	May be present	Segmental demyelination

Therapeutic Interventions:

Following clinical evaluation, a structured and individualized physiotherapy rehabilitation program was initiated in the intensive care unit for a patient diagnosed with the AIDP variant of Guillain–Barré Syndrome. The intervention was planned in accordance with the patient's neurological status, focusing on prevention of secondary complications, maintenance of physiological functions, and facilitation of early motor and functional recovery.

As the patient was hemodynamically stable and not on ventilatory support, respiratory physiotherapy was administered prophylactically to prevent pulmonary complications. This included diaphragmatic breathing exercises, thoracic expansion exercises, and segmental breathing techniques to enhance chest wall mobility and optimize ventilation. Active cycle of breathing techniques (ACBT) and assisted coughing were incorporated as needed to facilitate airway clearance along with spirometry to strengthen respiratory muscles. Respiratory rate, oxygen saturation, and chest expansion were monitored throughout the intervention.

Positioning strategies were rigorously followed to prevent pressure sores, joint stiffness, and deformities. The patient was repositioned every two hours, maintaining anti-deformity alignment, particularly neutral positioning of the ankles to prevent foot drop and functional positioning of upper limbs. Adequate support using pillows and cushioning was provided to ensure proper biomechanical alignment and comfort.

Passive range of motion exercises were initiated for all four limbs, performed within a pain-free range to maintain joint integrity and prevent contracture formation. Given the patient's muscle strength grading of 2/5 to 3/5, a gradual progression to active-assisted exercises was implemented, emphasizing controlled and fatigue-free movements. Repetitions and intensity were carefully regulated to avoid overexertion, considering the characteristic fatigability associated with Guillain–Barré Syndrome.

Proprioceptive Neuromuscular Facilitation (PNF) techniques were incorporated in a modified manner to facilitate motor activation and improve functional movement patterns. Trunk PNF techniques, including rhythmic stabilization and gentle dynamic reversals, were applied in supported sitting to enhance postural control and reduce trunk sway. Upper limb PNF patterns (D1 and D2) were performed using active-assisted movements with minimal resistance to improve coordination and functional reaching and grasping activities. Lower limb PNF patterns were utilized to facilitate movement patterns required for bed mobility and early functional tasks. All PNF interventions were performed at submaximal intensity with adequate rest intervals to prevent fatigue.

Early mobilization was introduced in a graded manner. Bed mobility training, including rolling and bridging activities, was facilitated with moderate assistance. The patient was progressed to supported sitting at the edge of the bed, focusing on improving trunk control and postural stability. Trunk facilitation techniques, including weight shifting and dynamic sitting balance exercises within the base of support, were incorporated to address impaired equilibrium and trunk sway observed during assessment.

Sensory re-education was initiated to address the glove and stocking distribution of sensory disturbances. Graded sensory stimulation techniques, including light touch, deep pressure, and proprioceptive input, were applied to enhance somatosensory awareness and integration.

Gentle neural mobilization techniques were incorporated in the form of nerve sliders for the lower limb neural structures, performed within a low amplitude and symptom-free range. Care was taken to avoid neural tensioning techniques to prevent exacerbation of nerve inflammation and ensure patient comfort.

Functional training focused on improving independence in activities of daily living. Task-specific upper limb activities such as reaching, grasping, and releasing were practiced. In addition, hand function training was emphasized using simple and readily available objects, including squeezing a water bottle, soft ball, and towel roll, along with repetitive grasp–release activities. These exercises were performed in multiple sets to improve grip strength, enhance fine motor control, and promote functional hand use.

Throughout the rehabilitation program, vital parameters were continuously monitored due to the potential risk of autonomic instability associated with Guillain–Barré Syndrome. Adequate rest intervals were incorporated between exercise sessions, and all activities were performed at submaximal intensity to prevent fatigue-induced deterioration.

The rehabilitation protocol was progressively modified based on the patient's tolerance and clinical improvement, with the overall aim of enhancing functional independence and promoting neurological recovery in the early phase of the condition.

Basis of Intervention

The physiotherapy intervention implemented in this case was structured in accordance with established international rehabilitation principles, particularly those outlined by the World Health Organization. The program followed a patient-centered, individualized, and function-oriented approach, emphasizing early intervention, prevention of secondary complications, and graded progression based on the patient's clinical status. All therapeutic procedures were performed within safe physiological limits with continuous monitoring of vital parameters to ensure patient safety and tolerance. The rehabilitation approach was aligned with evidence-based recommendations for neurological rehabilitation [11].

Figure 1. Respiratory physiotherapy using incentive spirometry to improve lung expansion and prevent pulmonary complications in the early ICU phase.

Figure 2: Hand function training using a water bottle to facilitate grip strength and improve fine motor control through task-oriented therapy.

Figure 3: Passive range of motion exercises for lower limbs to maintain joint mobility and prevent contracture formation during the acute phase.

Figure 4: Passive mobilization of upper limb joints to preserve range of motion and prevent stiffness.

Figure 5.1. **Figure 5.2.**

Figure 5.1 and 5.2: Active-assisted movement with facilitation techniques to promote motor activation and improve upper limb functional recovery.

Post-Assessment (After 2 Weeks of ICU-Based Rehabilitation)

A comprehensive reassessment conducted after two weeks of intensive care unit-based physiotherapy rehabilitation revealed significant clinical improvement across multiple domains. Reflex examination demonstrated improvement from initially diminished responses to near-normal superficial reflexes (+2) and improved deep tendon reflexes in both upper and lower limbs, with knee and ankle jerks becoming elicitable (+1). Muscle tone improved from (1+) to (2+) within normal limits across all muscle groups.

Manual Muscle Testing showed notable gains in strength, with proximal muscle groups of both upper and lower limbs improving from 3/5 to approximately 4/5, while distal muscle groups such as wrist and ankle musculature improved from 2/5 to 3/5–3+/5. Coordination assessment indicated enhanced performance,

with most upper limb coordination tasks approaching normal, and lower limb coordination showing moderate improvement. Equilibrium also improved, as the patient was able to maintain supported standing with assistance, although higher-level balance activities such as tandem walking and single limb stance were still not achievable.

Functional balance assessment revealed marked progress, with the patient now able to maintain independent static sitting without upper limb support and perform dynamic sitting activities with minimal trunk sway. Supported standing and initial weight-shifting activities were initiated with assistance.

Functional Independence Measure (FIM) scores demonstrated considerable improvement in motor domains. The total FIM score increased from 79/126 at baseline to 102/126 post-intervention. Motor FIM improved from 44/91 to 67/91, indicating enhanced independence in self-care, transfers, and locomotion, while cognitive FIM remained stable at 35/35. The patient progressed from requiring moderate to maximal assistance in most activities to requiring minimal assistance or supervision in several domains, particularly in bed mobility, transfers, and upper limb functional tasks.

Overall, the patient exhibited improved activity tolerance, better trunk control, enhanced coordination, and increased functional independence, reflecting positive neurological recovery following the structured two-week physiotherapy rehabilitation program.

Discussion

Guillain–Barré Syndrome (GBS), particularly the acute inflammatory demyelinating polyradiculoneuropathy (AIDP) variant, is characterized by immune-mediated demyelination of peripheral nerves, leading to acute onset symmetrical weakness, areflexia, and varying degrees of sensory impairment. The present case demonstrated classical features of AIDP, including ascending motor weakness, diminished reflexes, and sensory disturbances following a preceding upper respiratory tract infection, which is consistent with existing literature.

In this case, the progression and recovery profile may have been influenced by the patient's age. Neuromuscular re-education and symptomatic alleviation were achieved through augmented therapy, which included therapeutic exercises, transcutaneous electrical nerve stimulation (TENS), and task-specific training. These treatments have been shown to increase motor learning, decrease maladaptive pain signals, and enhance synaptic plasticity [7]

Patient exhibited distal limb pain and weakness, along with tingling sensations, which caused significant difficulties in walking and fine motor activities such as eating, writing, and using keys. These functional limitations had a considerable impact on his ability to perform activities of daily living (ADLs)Early physiotherapy intervention in the intensive care unit plays a crucial role in preventing secondary complications and facilitating neurological recovery. In this case, a structured rehabilitation program was initiated during the acute phase, emphasizing respiratory care, positioning, passive mobilization, and gradual progression to active-assisted and functional training. The inclusion of respiratory physiotherapy, despite the absence of ventilatory support, contributed to improved chest expansion and prevention of pulmonary complications [8].

Motor recovery in GBS is often gradual and influenced by the degree of nerve involvement. The observed improvement in muscle strength from Medical Research Council (MRC) grades 2–3/5 to higher functional levels highlights the effectiveness of early, graded, and fatigue-free exercise prescription. The incorporation of modified Proprioceptive Neuromuscular Facilitation (PNF) techniques aided in

enhancing motor control, trunk stability, and functional movement patterns without inducing overexertion, which is a critical consideration in GBS rehabilitation.

Sensory re-education and task-oriented training, including the use of simple tools such as water bottles for grip strengthening, played an important role in improving hand function and coordination. These functional and low-cost interventions are particularly relevant in clinical settings with limited resources.

The significant improvement in Functional Independence Measure (FIM) scores from 79 to 102 over a period of two weeks indicates meaningful gains in functional independence, especially in self-care and mobility domains. These findings support the importance of early multidisciplinary rehabilitation in enhancing recovery outcomes in GBS patients.

When comparing our findings with published AIDP-specific rehabilitation literature, it is notable that patients with demyelinating variant often show relatively favourable recovery compared to axonal forms. For example, in cohort of children with GBS, AIDP had higher rate of complete recovery at 3 months (56%) compared with AMAN [9,10].

Overall, this case reinforces that early ICU-based physiotherapy, when appropriately tailored and monitored, can accelerate functional recovery and reduce disability in patients with AIDP.

Limitations

This study is limited by its design as a single case report, which restricts the generalizability of the findings. The short duration of follow-up limits the understanding of long-term functional outcomes. Additionally, advanced outcome measures and electrophysiological reassessment post-intervention were not included. Further studies with larger sample sizes and longer follow-up periods are recommended to validate the findings.

Conclusion

This case study highlights the effectiveness of early, structured physiotherapy rehabilitation in the intensive care management of a patient with the AIDP variant of Guillain–Barré Syndrome. A comprehensive rehabilitation approach focusing on respiratory care, motor facilitation, sensory re-education, and functional training resulted in significant improvements in muscle strength, trunk control, and functional independence within a short duration. Early initiation of physiotherapy, along with careful monitoring and graded progression, is essential in optimizing recovery and improving overall patient outcomes in GBS.

Acknowledgement

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Ethical Approval

Ethical approval for this case study was obtained from the Institutional Ethics Committee of the respective institution prior to the commencement of the study. The study was conducted in accordance with ethical principles and guidelines for clinical research.

Consent to Participate

Written informed consent was obtained from the patient prior to inclusion in the study. The patient was informed about the nature, purpose, and procedures involved in the study, and participation was entirely voluntary.

Consent for Publication

Written informed consent was obtained from the patient for publication of clinical details and accompanying images. All efforts have been made to maintain patient confidentiality and anonymity.

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