

Variability in Recovery Outcomes in Guillain Barre Syndrome: A Multicenter Analysis

Wasim Barqawi*

Department of Neurology or Clinical Epidemiology, National University of Singapore (NUS), Singapore, Singapore

Introduction

Guillain-Barré Syndrome (GBS) is an acute, immune-mediated polyneuropathy with a highly variable clinical presentation and recovery trajectory. While most patients experience initial symmetrical weakness and areflexia, the pace, pattern and completeness of recovery vary widely between individuals. A multicenter analysis of rehabilitation outcomes across diverse geographical and healthcare settings offers critical insights into the factors that influence variability in recovery. This report synthesizes data from five rehabilitation centers across three countries each with standardized data collection protocols but differing patient demographics, intervention intensities and healthcare resources. Findings reveal significant inter-individual differences in functional gains, time to independent ambulation and return-to-work rates despite similar acute interventions such as IVIG or plasmapheresis. Several key factors emerged as predictive of positive outcomes: younger age, AIDP variant of GBS, early rehabilitation initiation and access to multidisciplinary therapy services. Conversely, older age, the AMAN variant, comorbid conditions (especially diabetes) and ICU admission with mechanical ventilation correlated with delayed or incomplete recovery [1].

Description

These variations underscore the multifactorial nature of GBS recovery, which is influenced not only by clinical severity but also by systemic, social and behavioral elements. The heterogeneity in outcome trajectories also reflects differing rates of axonal regeneration, patient engagement and rehabilitation intensity. Importantly, this analysis calls for the development of adaptable, person-centered rehabilitation protocols that accommodate individual variability while promoting standardized outcome monitoring. Understanding the causes and implications of this variability is crucial for tailoring care and setting realistic recovery expectations for patients and families. Motor function recovery showed the greatest variability across the study cohort, with timelines ranging from 2 weeks to over a year for significant mobility gains. Patients with early return of lower limb strength and preserved deep tendon reflexes demonstrated more rapid progress toward ambulation. In contrast, those requiring prolonged ventilatory support or experiencing cranial nerve involvement had protracted recovery courses. Rehabilitation centers with access to robotic-assisted gait training and intensive physical therapy reported shorter times to achieve independent walking, highlighting the role of technology and therapy intensity in functional gains. Additionally, fatigue severity emerged as a strong predictor of slowed motor recovery. Patients reporting high levels of fatigue assessed using the

Fatigue Severity Scale demonstrated poorer tolerance to activity and reduced therapy participation. These findings support the importance of fatigue management as a rehabilitation priority. Motor plateauing or secondary deterioration, though rare, was observed in a subset of older patients, raising the possibility of misdiagnosis or overlapping neuropathies [2].

Interestingly, the use of adjunct therapies such as hydrotherapy, NMES and proprioceptive training varied between centers, which may partially account for outcome disparities. Variability in therapist expertise and staffing ratios also affected therapy consistency, particularly in community-based follow-ups. Despite these challenges, structured task-specific training, including sit-to-stand repetitions, stair negotiation and balance re-education, proved beneficial across all sites. These findings advocate for early motor rehabilitation and targeted interventions based on patient tolerance and evolving strength profiles. Collectively, they affirm the need for dynamic motor rehabilitation strategies that evolve with the patient's capacity and integrate both traditional and emerging technologies. Sensory recovery and pain management demonstrated considerable differences across centers, shaped by both patient symptomatology and institutional treatment philosophies. While some patients reported rapid resolution of paresthesias and numbness, others continued to experience persistent sensory disturbances long after motor function returned. The variability in sensory recovery suggests differing degrees of nerve fiber involvement and highlights the importance of individualized sensory retraining protocols. Centers employing dedicated sensory integration therapy including desensitization exercises, texture training and balance retraining reported better patient-reported outcomes in fine motor function and gait stability. Neuropathic pain, present in nearly 40% of the cohort, also varied widely in severity and duration. Patients receiving early multidisciplinary pain management comprising pharmacological, physical and psychological interventions demonstrated better functional outcomes and higher satisfaction. Variations in access to pain specialists and pain assessment protocols may have contributed to disparities in pain control [3].

Importantly, psychological distress was more common in patients with persistent pain or prolonged sensory deficits, emphasizing the biopsychosocial interdependence of symptoms. Standardizing the use of sensory evaluation tools, such as Semmes-Weinstein monofilaments and vibration threshold testing, improved early detection and rehabilitation planning. Moreover, involvement of occupational therapists in sensory and fine motor retraining proved crucial for patients seeking to regain dexterity and hand function. These results highlight the need for early identification of sensory deficits and proactive, personalized pain management. Ultimately, addressing sensory and pain variability requires not only tailored clinical responses but also systemic improvements in resource availability, interdisciplinary training and patient education. Psychosocial outcomes, including emotional health, cognitive engagement and community reintegration, were among the most variable domains in this multicenter analysis. Depression, anxiety and adjustment disorders affected over 50% of patients during some phase of recovery, but their prevalence and severity were not consistently assessed or treated across sites. Centers with embedded psychological services and routine screening protocols achieved better outcomes in terms of emotional adjustment, therapy adherence and

*Address for Correspondence: Wasim Barqawi, Department of Neurology or Clinical Epidemiology, National University of Singapore (NUS), Singapore, Singapore, E-mail: barqawi.wasim@nus.sg

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patient satisfaction. Cognitive fog, reported by a subset of patients, impacted therapy participation and return-to-work planning, yet cognitive rehabilitation services were unevenly available. Return-to-work rates differed significantly ranging from 30% to 70% depending on vocational counseling access, employment flexibility and fatigue management [4-5].

Conclusion

In urban centers, patients benefited from structured community reintegration programs and peer support networks that reinforced confidence and social participation. In contrast, rural or under-resourced settings reported higher rates of social isolation, caregiver burnout and unplanned readmissions. Disparities in caregiver support, financial counseling and transportation services further contributed to uneven recovery trajectories. Cultural attitudes toward disability, family roles and mental health also influenced patient engagement and disclosure, adding complexity to psychosocial rehabilitation. This variability highlights the need for standardized emotional screening, culturally sensitive interventions and greater attention to the social determinants of health. Integrated care models, wherein patients receive medical, physical and psychosocial support under one framework, appear most promising in reducing these disparities. Policy recommendations include the expansion of mental health services in neurorehabilitation settings, improved referral pathways and inclusion of patient-reported outcomes in all domains of recovery. Ultimately, addressing variability in psychosocial outcomes is essential for ensuring holistic recovery in GBS patients and for designing equitable, inclusive care pathways.

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Conflict of Interest

None.

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