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CLINICAL AND ELECTROPHYSIOLOGICAL PATTERNS, TREATMENT MODALITIES, VENTILATORY REQUIREMENT, AND IN-HOSPITAL MORTALITY IN GUILLAIN-BARRÉ SYNDROME: A RETROSPECTIVE STUDY FROM A TERTIARY CARE CENTRE IN CENTRAL INDIA

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ABSTRACT

Background: Guillain-Barré syndrome (GBS) is an acute immune-mediated polyradiculoneuropathy exhibiting regional variation in electrophysiological subtypes, treatment utilization, and respiratory morbidity. Data characterizing subtype-specific ventilatory dependence and mortality in Central India remain limited. Objectives: To evaluate the demographic profile, electrophysiological variant distribution, therapeutic modalities, mechanical ventilation requirement, and in-hospital mortality among hospitalized GBS patients.**Materials and Methods:** This retrospective observational study was conducted in the Department of Medicine, Gandhi Medical College, Bhopal, from 1st August 2025 to 30th September 2026. Medical records of 41 clinically diagnosed GBS patients managed across the medical wards and intensive care unit (ICU) with complete follow-up data were analyzed.**Results:** Of 41 patients, 24 (58.5%) were males and 17 (41.5%) were females (M:F ratio 1.41:1). Young adults aged 21–40 years accounted for 75.6% (31/41) of cases (21–30 years: 16 [39.0%]; 31–40 years: 15 [36.6%]; 41–50 years: 7 [17.1%]; >50 years: 3 [7.3%]). Acute Inflammatory Demyelinating Polyneuropathy (AIDP) was the commonest variant (17/41, 41.5%), followed by Acute Motor Axonal Neuropathy (AMAN; 12/41, 29.3%), Acute Motor-Sensory Axonal Neuropathy (AMSAN; 10/41, 24.4%), Miller Fisher syndrome (1/41, 2.4%), and acute pandysautonomia (1/41, 2.4%). Immunotherapy was administered to 31 patients (75.6%): 29 (70.7%) received intravenous immunoglobulin (IVIg), 1 (2.4%) underwent plasmapheresis (PLEX), and 1 (2.4%) received PLEX followed by IVIg, while 10 (24.4%) received supportive care alone. Mechanical ventilation was required in 11 patients (26.8%), comprising 5 AMAN (41.7%), 4 AIDP (23.5%), and 2 AMSAN (20.0%) cases. In-hospital mortality was 9.8% (4/41)—2 AIDP (11.8%), 1 AMAN (8.3%), and 1 AMSAN (10.0%)—all of whom had received IVIg.**Conclusion:** GBS predominantly affected young adult males in our cohort. Axonal variants collectively comprised over half of all cases (53.7%), with AMAN demonstrating the highest rate of mechanical ventilation. IVIg was the primary immunotherapy utilized.

KEYWORDS : Guillain-Barré syndrome, AIDP, AMAN, Intravenous immunoglobulin, Mechanical ventilation, Mortality.

INTRODUCTION

Guillain-Barré syndrome (GBS) is an acute-onset, immune-mediated polyradiculoneuropathy characterized by rapidly progressive, symmetrical ascending weakness and areflexia [1]. Triggered in roughly two-thirds of patients by an antecedent gastrointestinal or respiratory infection via molecular mimicry, GBS remains the leading cause of acute flaccid paralysis worldwide following the near-eradication of poliomyelitis [2].

Electrophysiologically and pathologically, GBS encompasses distinct phenotypes, principally acute inflammatory demyelinating polyneuropathy (AIDP), acute motor axonal neuropathy (AMAN), and acute motor-sensory axonal neuropathy (AMSAN), alongside rarer variants such as Miller Fisher syndrome (MFS) and acute pandysautonomia [3]. Substantial geographical heterogeneity exists in subtype distribution: whereas AIDP accounts for over 80–90% of cases in Western populations, axonal variants (AMAN and AMSAN) represent 30–50% of cohorts across East and South Asia [4,5]. Standard disease-modifying immunotherapy consists of intravenous immunoglobulin (IVIg) or therapeutic plasma exchange (PLEX), both proven to hasten recovery when initiated early [1,2]. Because neuromuscular respiratory failure necessitating mechanical ventilation occurs in 20–30% of hospitalized patients and carries substantial mortality, defining local subtype patterns, treatment utilization, and clinical outcomes is vital for early risk stratification and intensive care resource allocation [6]. This study evaluated the clinical-electrophysiological spectrum, therapeutic modalities, ventilatory requirements, and mortality outcomes of GBS at a tertiary care centre in Central India.

MATERIALS AND METHODS

This hospital-based retrospective observational study was carried out in the Department of Medicine, Gandhi Medical College, Bhopal, Madhya Pradesh, over a 14-month period from 1st August 2025 to 30th September 2026. Case records of all adult patients clinically diagnosed with GBS according to the National Institute of Neurological Disorders and Stroke (NINDS) criteria and supported by cerebrospinal fluid analysis and nerve conduction studies (NCS) were retrieved from departmental and hospital archives. Only patients with complete clinical records, electrophysiological classification, treatment documentation, and in-hospital follow-up until discharge or death were included (N = 41). Patients with incomplete records, alternative causes of acute flaccid paralysis (such as hypokalemic periodic paralysis, transverse myelitis, myasthenic crisis, or botulism), or those who left against medical advice prior to outcome ascertainment were excluded. Because patients were dynamically triaged between the intensive care unit (ICU) and general medical wards according to evolving respiratory and autonomic status, critical illness severity was objectively quantified by the requirement for invasive mechanical ventilation. Data regarding age, sex, electrophysiological subtype, specific immunotherapy administered (IVIg, PLEX, sequential PLEX followed by IVIg, or supportive care alone), mechanical ventilation, and in-hospital mortality were analyzed using descriptive statistics.

RESULTS

A total of 41 clinically diagnosed GBS patients with complete follow-up were analyzed. Males outnumbered females, comprising 24 patients (58.5%) compared to 17 females (41.5%), yielding a male-to-female ratio of 1.41:1. Age distribution demonstrated a marked predilection for young adults: 16 patients (39.0%) were aged 21–30 years and 15 (36.6%) were aged 31–40 years, meaning 75.6% (31/41) of the cohort was between 21 and 40 years of age. Seven patients (17.1%) were aged 41–50 years, while only 3 (7.3%) were older than 50 years (Table 1).

Table 1: Demographic Characteristics and Treatment Modalities of GBS Patients (N = 41)

Clinical Variable	Category	Number of Patients (n)	Percentage (%)
Sex	Male	24	58.5%

	Female	17	41.5%
Age Group (Years)	21–30	16	39.0%
	31–40	15	36.6%
	41–50	7	17.1%
	>50	3	7.3%
Treatment Modality	IVIg monotherapy	29	70.7%
	Plasmapheresis (PLEX) alone	1	2.4%
	PLEX followed by IVIg	1	2.4%
	Supportive care only	10	24.4%
Total	All Patients	41	100.0%

Electrophysiological subtyping revealed that AIDP was the single most prevalent variant (17/41; 41.5%), whereas axonal variants collectively constituted over half of the cohort (22/41; 53.7%), comprising 12 patients (29.3%) with AMAN and 10 (24.4%) with AMSAN. Uncommon phenotypes included 1 case (2.4%) each of Miller Fisher syndrome and acute pandysautonomia. Disease-modifying immunotherapy was administered to 31 patients (75.6%): 29 (70.7%) received IVIg alone, 1 (2.4%) underwent PLEX alone, and 1 (2.4%) received sequential PLEX followed by IVIg due to inadequate initial response, while 10 patients (24.4%) were managed with supportive care alone (Table 1).

Invasive mechanical ventilation was required in 11 of 41 patients (26.8%), comprising 5 of 12 AMAN patients (41.7%), 4 of 17 AIDP patients (23.5%), and 2 of 10 AMSAN patients (20.0%); neither the Miller Fisher syndrome nor the acute pandysautonomia patient required ventilatory support. AMAN accounted for 45.5% (5/11) of all ventilated cases. In-hospital mortality occurred in 4 patients (9.8%): 2 in the AIDP group (2/17; 11.8%), 1 in the AMAN group (1/12; 8.3%), and 1 in the AMSAN group (1/10; 10.0%) (Table 2). All 4 deceased patients had received IVIg therapy.

Table 2: Electrophysiological Subtypes, Mechanical Ventilation Requirement, and Mortality (N = 41)

Electrophysiological Variant	Total Cases n (% of 41)	Ventilator Required n (% within variant)	Share of Ventilated (n = 11)	Mortality n (% within variant)
AIDP	17 (41.5%)	4 (23.5%)	36.4% (4/11)	2 (11.8%)
AMAN	12 (29.3%)	5 (41.7%)	45.5% (5/11)	1 (8.3%)
AMSAN	10 (24.4%)	2 (20.0%)	18.2% (2/11)	1 (10.0%)
Miller Fisher Syndrome	1 (2.4%)	0 (0.0%)	0.0% (0/11)	0 (0.0%)
Acute Pandysautonomia	1 (2.4%)	0 (0.0%)	0.0% (0/11)	0 (0.0%)
Total	41 (100.0%)	11 (26.8%)	100.0% (11/11)	4 (9.8%)

DISCUSSION

This study delineates the clinical, electrophysiological, and therapeutic profile of hospitalized GBS patients at a tertiary referral centre in Central India. Consistent with published Indian series, we observed a male preponderance (58.5%, M:F ratio 1.41:1) and a marked concentration among young adults aged 21–40 years (75.6%) [5,7]. Unlike Western cohorts exhibiting a bimodal age peak extending into older adulthood, Indian cohorts consistently skew younger, likely reflecting greater exposure to enteric and respiratory pathogens alongside population demographics [4,5].

Although AIDP was the single most common variant (41.5%), axonal subtypes combined (AMAN 29.3% and AMSAN 24.4%) comprised 53.7% of cases. These findings align with multicentric Indian reports showing a substantial burden of axonal neuropathy—often linked to antecedent Campylobacter jejuni enteritis—in contrast to the demyelinating predominance in Western countries [4,5,8]. Rare phenotypes (Miller Fisher syndrome and acute pandysautonomia, 2.4% each) highlight the need for clinical vigilance toward atypical presentations.

Over three-quarters of our patients (75.6%) received immunotherapy, predominantly IVIg (73.2% overall, including 1 patient treated sequentially after PLEX). The strong preference for IVIg over PLEX reflects its ease of administration, wider availability, and lower risk of hemodynamic instability in dysautonomic patients [1,2]. One patient received sequential PLEX followed by IVIg; while guidelines discourage PLEX after IVIg due to immunoglobulin washout, administering IVIg after PLEX is occasionally utilized in refractory disease [1]. Nearly one-quarter (24.4%) received supportive care alone, reflecting mild non-progressive deficits or financial constraints.

Mechanical ventilation was required in 26.8% (11/41) of patients, matching the globally reported 20–30% range [6,9]. Notably, AMAN patients had the highest intubation rate (41.7% within AMAN; accounting for 45.5% of all ventilated patients), compared to 23.5% in AIDP and 20.0% in AMSAN, likely due to rapid motor axonal conduction failure and early phrenic nerve involvement [8,9]. Overall mortality was 9.8% (4/41), comparable to Indian tertiary-care rates of 7–12% [5,7,9]. All 4 deceased patients had received IVIg, and mortality rates were similar across AIDP (11.8%), AMSAN (10.0%), and AMAN (8.3%), indicating that fulminant bulbar-respiratory failure and ICU complications drove fatality rather than subtype-specific treatment failure.

Limitations include the retrospective single-centre design, modest sample size, and inability to quantify exact ICU stay due to dynamic ward-ICU transfers. Nevertheless, complete follow-up and subtype-level stratification of therapy, ventilation, and survival provide valuable regional benchmarks for Central India.

CONCLUSION

GBS at our Central Indian tertiary centre predominantly affected young adult males aged 21–40 years. While AIDP was the single commonest variant, axonal subtypes (AMAN and AMSAN) represented over half of all cases, with AMAN carrying the highest risk of mechanical ventilation (41.7%). IVIg was the primary immunotherapy used, and early electrophysiological subtyping coupled with vigilant respiratory monitoring remains essential to optimizing survival.

DECLARATIONS

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Conflict of Interest: None declared.

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