ORIGINAL ARTICLE

Clinical Profile and Outcome of Guillain Barré Syndrome in a Tertiary Care Hospital: A Retrospective study

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Abstract

Introduction: Guillain-Barré syndrome is an acute autoimmune polyradiculopathy characterized by a highly variable long-term prognosis. There are few data from resource limited settings like Nepal that have evaluated the long-term outcome of Guillain-Barré syndrome. The objective of this study was to assess the clinical characteristics and disability outcomes after one year in Guillain-Barré syndrome patients at a tertiary care center.

Methods: This was a retrospective study conducted in adult patients diagnosed with Guillain-Barré Syndrome at a tertiary care center from May 2023 to May 2024. Ethical approval was obtained from the Institutional Review Board of the same center prior to data collection (Reference. No. 482-082/083). Data were extracted from hospital records using a structured proforma and supplemented by follow-up consultations. Total 62 patients were included. The outcome of the patients was assessed according to Hughes Guillain Barre Disability Scale. One-year outcomes were classified as favorable or unfavorable. Statistical analysis was performed using Statistical Package for the Social Sciences version 18.0.

Results: The most common type clinically was typical Guillain-Barré syndrome 55 (88.71%) and electrophysiologically acute inflammatory demyelinating polyneuropathy 21 (37.50%). Out of total, 34 (54.84%) of patients received symptomatic treatment, 17 (27.42%) got intravenous immunoglobulin, and 11 (17.74%) got plasma exchange. After a year 51 (62.30%) patients were evaluated for outcome, out of which 47 (92.20%) of them had a good outcome, and 4 (7.80%) of them had a bad outcome.

Conclusions: Most Guillain-Barré syndrome patients exhibited significant recovery after a year.

Keywords: *disability outcome; Guillain-Barré syndrome; prognostic factors.*

Introduction

Guillain Barré syndrome (GBS) also known as post-infectious or acute idiopathic polyneuropathy, is an acquired autoimmune disorder of the peripheral nervous system and one of the most common neurological emergencies.[1] It presents with rapidly progressive symmetrical limb weakness, gait

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disturbance, areflexia, sensory symptoms, pain, autonomic dysfunction, and elevated cerebrospinal fluid protein without pleocytosis.[2] The major subtypes include acute inflammatory demyelinating polyneuropathy (AIDP), acute motor axonal neuropathy (AMAN), acute motor and sensory axonal neuropathy (AMSAN), and Miller Fisher syndrome (MFS).[3] Although AIDP is the predominant subtype in Western countries, axonal variants are more common in Asia and are generally associated with more severe disease.[4,5]

Despite treatment with intravenous immunoglobulin or plasma exchange, GBS remains associated with substantial disability and mortality. Approximately 14% of patients have severe disability at one year, while up to 40% experience persistent weakness, pain, or occupational limitations.[6] GBS Disability Scale (GBS-DS) is widely used to assess functional outcomes.[7]

This study aimed to evaluate one-year disability outcomes and identify factors associated with poor prognosis in patients with GBS.

Methods

This was a retrospective analytical study conducted at the Department of Neurology, Tribhuvan University Teaching Hospital, a tertiary care center in Kathmandu, Nepal. The study evaluated patients admitted with a diagnosis of Guillain-Barré Syndrome (GBS) over a one-year period from May 2023 to May 2024. Ethical approval was obtained from the Institutional Review Board (IRB) of Institute of Medicine (IOM) prior to data collection (Ref. No. 482-082/083).

Data were extracted from hospital records using a structured proforma and supplemented by follow-up consultations. We collected baseline demographic information (age and sex), history of antecedent events (fever, respiratory tract infection, diarrhea), and clinical presentations.

Patients were categorized into clinical variants (Typical GBS, Miller Fisher Syndrome, Bulbar, Paraparetic, and Facial Diparetic) and electrophysiological subtypes (AIDP, AMAN, AMSAN, or Normal) based on nerve conduction studies (NCT). The presence of albuminocytological dissociation in cerebrospinal fluid (CSF), autonomic dysfunction, and the requirement for mechanical ventilation were also documented.

The primary dependent variable was the Hughes GBS Disability Scale (GBS-DS) score. Either the patient or the patient's relatives were called on their telephone numbers to make an enquiry regarding their functional recovery. This study used walking ability as an outcome measure. We defined a poor outcome as the inability to walk independently (GBS disability score ≥3) and a good outcome as being able to walk independently after 1 year (GBS disability score ≤2).[8,9]

For statistical analysis, outcomes were dichotomized into:

Good Outcome: (e.g., GBS-DS 0-2; able to walk independently).

Bad Outcome: (e.g., GBS-DS 3-6; bedridden, requiring assistance, or death).

Statistical analysis was performed using Statistical Package for the Social Sciences version 18.0.. Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as mean ± standard deviation (SD) or median with interquartile range (IQR), as appropriate.

To identify factors associated with disability outcomes, univariate analysis was conducted. The association between age and outcome was analyzed using the independent sample t-test. The Chi-square test (or Fisher's exact test where cell counts were low) was employed to examine associations between the disability outcome and nominal variables, including sex, clinical/NCT variants, treatment modalities, and autonomic dysfunction. A $p<0.05$ was considered statistically significant.

Results

Out of total hospital discharge records during the specified time frame, 62 cases diagnosed with GBS were identified and included in the study. Of these, 51 patients could be reached upon for the outcome questioning regarding the functional recovery based on GBS disability score and were included in the outcome analysis.

The mean age of this cohort was 40.18±17.52 years, with most patients belonging to the 30-60 age group 29 (46.77%), followed by <30 years 24 (38.71%) and >60 years 9 (14.52%). Males were predominant 46 (74.19%), with a male-to-female ratio of approximately 2.9:1. The typical form of GBS was the most common clinical variant, accounting for 55 (88.71%) cases. The number of patients with a history of antecedent event was 20 (32.26%) (Table 1).

Nerve conduction studies were performed in 56 patients. Acute inflammatory demyelinating polyneuropathy was the most common electrophysiological subtype with 21 (37.50%) cases. Among the 46 patients who underwent lumbar puncture, 32 (69.57%) had cerebrospinal fluid albuminocytological dissociation; 6 (9.68%) patients required mechanical ventilation whereas 16 (25.81%) of patients had autonomic dysfunction at presentation. Regarding treatment, 34 (54.84%) patients received only symptomatic treatment (Table 1).

Table 1: Baseline demographic and clinical characteristics of patients

Variable	n (%)
Sex (n=62)	
Male	46 (74.19)
Female	16 (25.81)
Age (years); Mean±SD	40.18±17.52
Age group (n= 62)	
<30 years	24 (38.71)
30-60 years	29 (46.77)
>60 years	9 (14.52)
Clinical variant (n= 62)	
Typical GBS	55 (88.71)
Miller Fisher syndrome	3 (4.84)
Bulbar	2 (3.23)
Paraparetic	1 (1.61)
Facial diparetic	1 (1.61)
Antecedent events (n= 62)	
None	42 (67.74)
Fever	6 (9.68)
Upper respiratory tract infection	5 (8.06)
Diarrhea	9 (14.52)
Nerve conduction study (NCT) variant* **(n=56)**	
Normal	9 (16.07)
AIDP	21 (37.50)
AMAN	11 (19.64)
AMSAN	15 (26.79)
Albuminocytological dissociation* **(n= 46)**	
Present	32 (69.57)
Absent	14 (30.43)
Treatment received (n= 62)	
Symptomatic only	34 (54.84)
IVIG	17 (27.42)
Plasmapheresis	11 (17.74)
Mechanical ventilation (n= 62)	
Required	6 (9.68)
Not required	56 (90.32)
Autonomic symptoms (n= 62)	
Present	16 (25.80)
Absent	46 (74.20)

The assessment of functional outcomes during telephone interviews occurred 1 year after the patient's last admission. Out of 62 patients, 51 (82.30%) were reachable by phone for the interview. Overall, 47 (92.16%) patients had a good outcome, and 4 (7.84%) patients had a poor functional outcome (Figure 1).

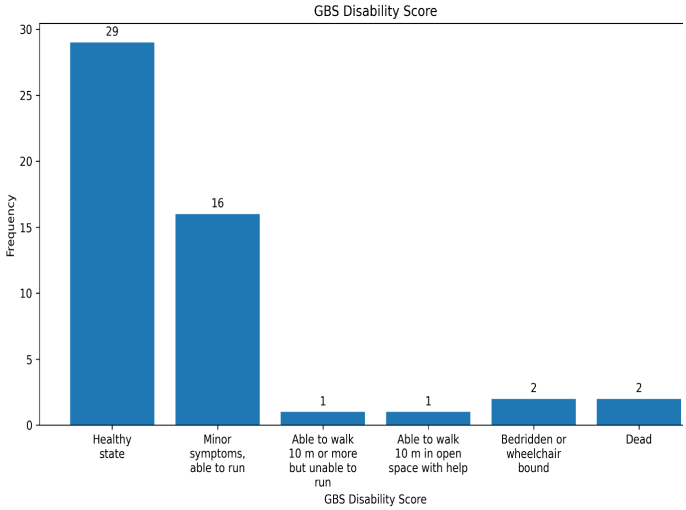

Figure 1: Hughes GBS-disability score at one year

The mean age of patients with bad outcome (46.75±28.24 years) was higher than that of patients with good outcome (40.19±16.23 years), but the difference was not statistically significant (t= -0.731, p= 0.677). Males had a better outcome than females, but the difference was not statistically significant (χ^2= 2.074, p= 0.150). The proportion of patients older than 60 years had a higher rate of bad outcome than patients younger than 30 years and those aged 30-60 years, but the association was not statistically significant (χ^2= 4.866, p= 0.088). No statistically significant associations were found between antecedent events, clinical variants, nerve conduction test subtypes, albuminocytological dissociation, mechanical ventilation, and autonomic symptoms (all p>0.05). The proportion of patients with bad outcomes who received plasma exchange was higher than those who received IVIG and symptomatic treatment, and this difference was statistically significant (χ^2= 8.665, p= 0.013) (Table 2). Descriptive analysis showed that patients with autonomic dysfunction and higher GBS disability scores tended to require mechanical ventilation more frequently. Likewise, patients with autonomic dysfunction, severe disability scores, and specific clinical or electrophysiological variants tend to have worse outcomes. However, multivariate analysis was not done due to the small number of patients with unfavorable outcomes (n= 4).

Table 2: Univariate Analysis of Factors Associated with Bad Outcome

Variable	Good Outcome (n= 47)	Bad Outcome (n= 4)	p-value
Age	40.19±16.23	46.75±28.24	0.677
Age group			
<30 years	17 (36.17)	1 (25)	
30-60 years	25 (53.19)	1 (25)	0.088
>60 years	5 (10.64)	2 (50)	
Gender			0.150
Male	38 (80.85)	2 (50)	
Female	9 (19.15)	2 (50)	
Antecedent events			0.576
No	33 (70.21)	2 (50)	
Fever	4 (8.51)	1 (25)	
URTI	4 (8.51)	-	
Diarrhea	6 (12.77)	1 (25)	
Clinical variant			0.952
Typical GBS	40 (85.10)	4 (100)	
MFS	3 (6.39)	0	
Bulbar	2 (4.25)	0	
Paraparetic	1 (2.13)	0	
Facial diparetic	1 (2.13)	0	
NCT variant	n= 45	n= 2	0.705
Normal	9 (20.00)	0	
AIDP	16 (35.55)	1	
AMAN	9 (20.00)	0	
AMSAN	11(24.45)	1	
Albuminocytological Dissociation (n= 39)	n= 35	n= 4	0.792
Yes	24 (68.57)	3 (75)	
No	11 (31.43)	1 (25)	
Treatment	n= 47	n= 4	**0.013***
Symptomatic	24 (51.06)	1 (25)	
IVIG	16 (34.04)	-	
Plasmapheresis	7 (14.90)	3 (75)	
Mechanical ventilation			0.392
Yes	5 (10.63)	1 (25)	
No	42 (89.37)	3 (75)	
Autonomic symptoms			0.92
Yes	12 (25.53)	2 (50)	
No	35 (74.47)	2 (50)	

Discussion

The demographic characteristics of our study population largely align with global and regional GBS patterns, with some differences. The mean age was 40.18±17.52 years, lower than the 50 years reported by Balagopal et al.[10] but comparable to other studies.[11-13] Age stratification showed that 46.80% of cases occurred between 30-60 years, indicating that GBS predominantly affects the economically active population.

Male predominance (74.19%; male-to-female ratio 2.9:1) exceeded the global ratio of approximately 1.5:1 but was consistent with Asian studies. An eastern Indian study reported 70% male patients,[13] while others reported approximately 60%.[10,11,14,15] This disparity may reflect biological susceptibility, occupational exposure to antecedent pathogens, and differences in healthcare-seeking behavior.

Typical GBS accounted for 88.71% of cases, consistent with Western reports where classical ascending paralysis predominates. MFS constituted 4.84%, lower than some Asian reports but within the global estimate of 1-5% of GBS cases. Bulbar (3.22%), paraparetic (1.61%), and facial diparetic (1.61%) variants demonstrated phenotypic heterogeneity but remained uncommon.

MFS accounts for 5-10% of GBS cases in Western countries but up to 25% in Japan.[3] A southern China cohort identified 125 MFS cases among 1,056 GBS-spectrum patients, supporting its higher prevalence in Chinese populations.[16] The lower MFS frequency in our Nepalese cohort may reflect geographical differences in antecedent infections, particularly Campylobacter jejuni serotypes associated with distinct GBS phenotypes. The predominance of typical GBS has implications for clinical recognition, as atypical presentations may be under-recognized in resource-limited settings.

AIDP was the most common electrophysiological subtype (37.50%) in our cohort, comparable to Indian and Chinese studies.[17,18] A northern Chinese study reported AIDP in 37.80% of cases, although AMAN predominated (40.10%).[15] An eastern Indian study reported AIDP in 54.40%, AMAN in 20.30%, and AMSAN in 17.70% of 79 patients.[18] The lower AIDP prevalence in our cohort, despite geographical proximity, may reflect differences in antecedent infections, seasonal variation, or nerve conduction study interpretation. Normal nerve conduction studies were observed in 16.07% of patients, possibly due to early presentation, technical limitations, or true normal variants.

Only 32.26% of patients in our study reported antecedent events before GBS onset, whereas most studies report antecedent events in the majority of cases.[19] Aslam et al. reported only 29.80% of patients without antecedent events, contrasting with our findings.[20] This may have implications for understanding GBS pathophysiology in our setting.

Treatment patterns reflected healthcare resource limitations in Nepal. More than half of patients (54.84%) received only symptomatic treatment without intravenous immunoglobulin (IVIG) or plasma exchange (PE), contrasting with high-income countries where immunomodulatory therapy is standard. IVIG and PE were used in 27.42% and 17.74% of patients, respectively, reflecting limited availability and affordability. Similar patterns have been reported in Bangladesh, where only 15% of patients receive IVIG or standard PE and 85% receive supportive care alone.[21]

At one year, 92.15% of patients achieved good outcomes (GBS-DS 0-2), indicating a favorable prognosis. This may be attributable to the relatively high proportion of AIDP (37.50%) and the younger age distribution, with 85.50% of patients younger than 60 years. Outcome assessment based on patient or family reports may also have overestimated recovery compared with objective neurological examination.

The most unexpected finding was the significant association between PE and worse one-year outcomes. This contrasts with evidence showing PE is as effective as IVIG in GBS. The landmark Plasma Exchange/Sandoglobulin Guillain-Barré Syndrome Trial Group found no significant difference in disability outcomes between PE and IVIG, although both accelerated recoveries compared with supportive care alone.[22]

A more plausible explanation is confounding by indication, whereby PE was preferentially administered to patients with more severe disease. In resource-limited settings such as Nepal, costly immunomodulatory therapies are often reserved for patients with rapidly progressive weakness, respiratory failure, autonomic dysfunction, or greater disability. Financial constraints also led many patients to choose PE despite indications for IVIG, while some could not complete PE because of complications such as sepsis or shock. Rajabally and Uncini identified advanced age, rapid progression, ventilatory requirement, and severe disability at presentation as predictors of poor outcome, whereas treatment modality was not an independent predictor after adjustment for baseline severity.[6] Therefore, the observed association between PE and poor outcome most likely reflects greater baseline disease severity rather than a detrimental treatment effect.

Our study has several limitations. The relatively small sample size limited robust statistical analyses, including multivariable analysis, and warrants of cautious interpretation. Missing follow-up data in 11 patients (17.74%) may have introduced bias if patients with poorer outcomes were less likely to be contacted. The single-center tertiary hospital setting also limits the generalizability of our findings.

Conclusions

Most patients with Guillain-Barré syndrome in this Nepalese tertiary-care cohort experienced good functional recovery after one year. Typical GBS and AIDP were the predominant clinical and electrophysiological subtypes. Although plasma exchange was associated with poorer outcomes, this finding likely reflects greater disease severity among treated patients rather than a true adverse effect of therapy.

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