

## Research Article

# Mild Form of Guillain Barre Syndrome, Clinical Characteristics and Outcome with or Without Plasmapheresis: A Local Experience

Adnan Tariq,<sup>1</sup> Safia Bano,<sup>2</sup> Ayesha Aslam,<sup>3</sup> Syed Arsalan Haider,<sup>4</sup> Rashid Imran,<sup>5</sup> Ahsan Numan<sup>6</sup>

<sup>1,4,5</sup>Department of Neurology, Punjab Institute of Neurosciences (PINS)/ Lahore General Hospital, Lahore;

<sup>2,3,6</sup>Department of Neurology, KEMU/ Mayo Hospital, Lahore

### Abstract

**Background:** Guillain-Barre syndrome is an immune mediated poly-radiculo-neuropathy with a variable clinical presentation and prognosis. Plasma exchange and Intravenous immunoglobulin are treatment options with proven efficacy by various clinical trials. But these trials demonstrate improvement in a classical and moderate to severe GBS. In clinical setting, problem may occur in treatment of those patients who present with mild symptoms & signs, clinical variants of GBS, or when the duration of weakness is > 2 weeks from onset of symptoms.

**Objective:** To determine the frequency of mild GBS, its clinical characteristics & to compare clinical outcome of patients treated with or without plasmapheresis.

**Methods:** Prospective, Quasi experimental study was done in Neurology, MHL from June, 2020 to June, 2022. Diagnosis of mild GBS was made on basis of patient ability to walk without support/ GBS disability score is  $\leq 2$ . Outcome in these patients was assessed by using MRC sum score at presentation one and 3month post treatment.

**Results:** Patients with diagnosis of GBS (n=154) were admitted and treated during 2years.out of these patients, 22(14.28%) were diagnosed as mild GBS, 18 males and 4 females. MRC Sum score at presentation 18.5, at 1-month 19.7 and at 3 month it was 19.5 on average. MRC sum score improvement noted in patients treated with plasma-pheresis at one and three months with p value less than 0.01. There was no difference in recovery with increased number of sessions of plasma-pheresis 3 versus 5 sessions at one month and 3months with p value 0.18 & 0.32 respectively.

**Conclusion:** Mild GBS is not uncommon, remained under-reported in clinical scenario. Plasma-pheresis seems to have a beneficial role in mild form of GBS

**Corresponding Author** | Dr Safia Bano, Assistant Professor, Department of Neurology, KEMU/ Mayo Hospital, Lahore.

**Email:** safiabano207@gmail.com

**Keywords** | Mild Gillian Barre Syndrome (GBS), Plasmapheresis (PE), Intravenous immunoglobulins (IVIG)

### Introduction

Guillain-Barre syndrome (GBS) is an immune mediated acute polyneuropathy with a characteristic

ascending pattern of weakness with variable disease pattern and prognosis.<sup>1</sup> It is a worldwide disease prevalence with an annual global incidence of approximately 1–2 per 100,000 person-years.<sup>2</sup>

GBS has classified on the basis of clinical and electrophysiological finding (AIDP, AMAN, AMSAN, and ASAN). GBS divided into mild moderate and severe according to GBS Disability Scale 0 (healthy), 1 (minor symptoms & can run), 2(able to walk without support),



#### Production and Hosting by KEMU

<https://doi.org/10.21649/akemu.v30i1.5241>

2079-7192/© 2024 The Author(s). Published by Annals of KEMU on behalf of King Edward Medical University Lahore, Pakistan.

This is an open access article under the CC BY4.0 license <http://creativecommons.org/licenses/by/4.0/>

3(able to walk with help), 4(bedbound), 5(need ventilator support) and 6 (dead).<sup>3</sup>

Various treatment options are available with proven efficacy in various randomized control trials. These pharmacological treatment options are intravenous immunoglobulin (IVIG) and plasma exchange (PE). Some trials have been done on injectable steroid as first line treatment but no significant outcome making this option controversial. Both IVIG and PE are equally effective in reducing time for recovery in moderate to severe GBS cases, hence improved clinical outcome.<sup>4</sup>

Mild form of GBS, defined as a person who can walk independently but cannot run, has been under reported with different studies showing different prevalence.<sup>5</sup>

A study conducted by Verboon. C, et al. compared treatment of mild GBS with IVIG verses supportive care only showed there is limited to no benefit to treat mild GBS with IVIG in long-term outcome.<sup>6</sup>

Treatment of mild GBS with plasma-pheresis showed duration of disease was significantly less with plasma exchange as compared with supportive therapy along.<sup>7</sup>

It is difficult to predict which mild GBS patient condition will remain stable during early clinical course of disease during observation. Treatment dilemma remained about mild form of GBS (those patients who remained stable for >2 weeks or walk independently since the disease onset). Criteria for categorized GBS as mild, moderate and severe based on motor scale but did not address other symptoms like facial weakness, paresthesias which need to be addressed. There is sparse or little literature/ evidence base guidelines are available regarding treatment of mild GBS. So, aim of my study is to know the frequency, clinical characteristics of mild GBS and outcome with or without treatment.

## Methods

After taking approval from ethical committee of King Edward Medical University Lahore, A Prospective, Quasi experimental study was conducted in Neurology department Mayo hospital, Lahore. Medical record of total no. of GBS patients admitted in neurology department in last 2 years from June, 2020 to June 2022 was noted on predesigned proforma. Diagnosis of GBS was based on history of weakness of limbs with or without sensory disturbance, cranial nerve involvement and

electrophysiological findings suggestive of GBS. Diagnosis of mild GBS was made on basis of patient ability to walk without support during their illness or GBS disability score is  $\leq 2$ . All those patients who had moderate to severe GBS or a GBS disability scale of 3–6 was excluded from study.

Data regarding mild GBS patients (n=8) who received plasma-pheresis (via non probability-purposive sampling technique) and patients (n=14) that did not get any definite treatment/supportive treatment only was noted. Then patients were called for follow-up in OPD and clinical assessment for outcome was done prospectively for GBS patient according to Medical Research Council (MRC)-sum score 11. Outcome in both patients' groups was assessed.

Data was entered and analyzed by SPSS 23. Quantitative variables such as age, time to onset from presentation and MRC sum score, CSF findings were considered as mean and confidence interval. Qualitative variables such as gender, preceding history of fever, clinical features (signs and symptoms), plasma-pheresis and electrophysiological findings were considered frequency and percentage. Medical council research sum score at the time of presentation, after one and 3 month were noted. Both groups were compared for outcome by using independent sample t test and p-value  $\leq 0.05$  was considered as statistically significant.

## Results

Total number of patients with diagnosis of GBS (n=154) were admitted and treated during 2 years. Out of these patients, 22(14.28%) were diagnosed as mild GBS. The mean age of patients was 34.2 years with 95% C.I (29.1 – 39.2) years (Range 14 to 63, SD 11.37). Study sample (22 patients) includes 4(18.2%) females, 18 (81.8%) male cases. A history of preceding viral illness was positive in 10(45.5%) patients. Sore throat symptom was found in 4(18.2%). Pain was demonstrated by 14 (63.6%) patients, and facial cranial neuropathy was present in 6(27.3%). Details is reported in table 1.

Graph -1 reports that 36.4% were on treatment, 45.5% with scanty F wave Upper Limb, 27.3% with delayed F wave Lower Limb, 9.1% with reduced Velocity Upper Limb, 36.4% with reduced velocity Lower Limb, 18.2% with reduced motor amplitude Upper Limb, 9.1% with

reduced motor amplitude Lower Limb, 45.5% with delayed motor latency Upper Limb, 63.6% with delayed motor latency Lower Limb, all cases with normal sensory amplitude Upper and Lower Limb, 27.3% were delayed sensory latency Upper Limb same on Sensory latency Lower Limb.

Table -2 reports the mean with 95% confidence interval for quantitative parameters of studied cases, the mean worst motor scale scores was 16.7 (15.9 – 17.5) units, mean number of days to maximum weakness were

**Table 1:** Descriptive parameters of GBS Patients (Sex, Preceding Viral, Symptoms, Pain and Cranial Neuropathy)

Characteristics		n	%
Sex	Male	18	81.8
	Female	4	18.2
Age (years)	Mean (95% c.i)	34.2	(29.1 – 39.2)
Preceding viral	Positive	10	45.5
	Negative	12	54.5
Symptom	No symptoms	14	63.6
	Cough	2	9.1
	Diarrhea	2	9.1
	Sore throat	4	18.2
Pain	Positive	14	63.6
	Negative	8	36.4
Cranial neuropathy (facial)	Negative	16	72.7
	Bilateral nerve	2	9.1
	Left nerve	1	4.5
	Right nerve	3	13.6

**Table 2:** Weakness (MRC Sum score) at the time of presentation, laboratory parameters and on follow up

Variables	Mean	95% C.I
Number of days to maximum weakness	4.9	(3.8 – 6.0)
CSF protein(mg/dl)	92.0	(71.5 – 112.5)
LP done after days	8.2	(7.0 – 9.4)
Sessions	4.0	(3.1 – 4.8)
NCS after onset	8.0	(6.9 – 9.0)
Worst motor scale at presentation	<b>16.7</b>	<b>(15.9 – 17.5)</b>
Progress immediate	18.5	(17.7- 19.2)
1month	19.7	(19.3 – 20.1)
3month	19.5	(19.1 – 19.9)

4.9(3.8 – 6.0), mean CSF 92.0 (71.5 – 112.5), mean LP done after 8.2 days (7.0 – 9.4), mean sessions were 4.0 (3.1- 4.8), mean NCS after onset 8.0 (6.9 – 9.0), mean Progress IMM 18.5 (17.7 – 19.2), at 1-month 19.7 (19.3 – 20.1) and at 3 month it was 19.5 (19.1- 19.9) on average.

Table -3 reports medical research counsel sum score improvement in patients treated with plasma-pheresis(8) versus supportive only(14) at one and three months with p value less than 0.01.

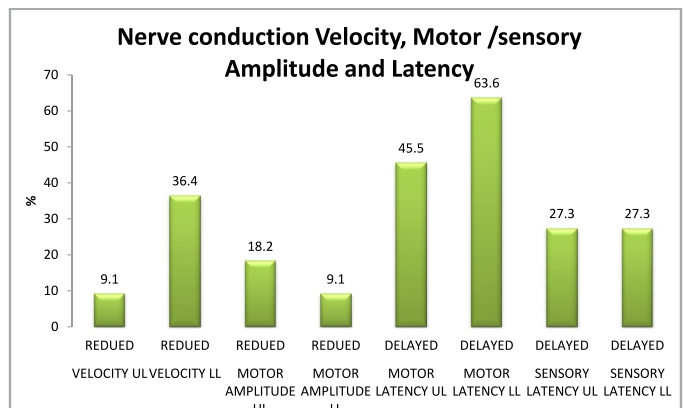
Our study showed no difference in recovery with increased number of sessions of plasma-pheresis 3 versus 5 sessions at one month and 3months with p value 0.18 &0.32 respectively. 3 sessions were enough to show a

**Table 3:** Outcome of mild GBS patients with and without plasmapheresis

	Treatment	n	Mean	Std. Deviation	p-value
PROG IMM	Yes	8	18.5000	.92582	0.008*
	No	14	16.7143	1.89852	
1Month	Yes	8	19.7500	.46291	<0.01*
	No	14	18.1429	1.02711	
3Month	Yes	8	20.0000	.00000	0.012*
	No	14	19.2857	.91387	

\*p<0.05 was considered statistically significant using independent sample t-test

statistically significant recovery.



**Figure 1:** Nerve conduction study (NCS) findings in Patient with mild GBS

## Discussion

This was a 2-year study, being conducted between 2020 to 2022 in which, our experience 14.1% were milder form of GBS out of the total cases of 154, which is same as reported by P.A. Van Doorn et al.<sup>9</sup> It also comes close to the number reported by winter et al. at 12%.<sup>12</sup> But varies with the reported number in Netherlands mild forms of Guillain-Barre' syndrome in an epidemiologic survey in the Netherlands of 28%<sup>13</sup> and 35% reported in a population-based study in Denmark.<sup>8</sup>

There was significant male proportion of mildly affecting patients reaching 82 percent which is higher than most studies which generally show a percentage reaching 60 percent of male preponderance.<sup>8</sup> Possible cause might be cultural as female health care is generally ignored.

Our study reported similarities regarding its prevalence in younger age group which report mostly patients affected to be less than 50.<sup>13</sup>

A Preceding infection 45.5 % in slightly lower than report in 2 studies in Netherlands,<sup>9,13</sup> which report a 72% and 58% percent respectively but is similar to a study conducted in Israel.<sup>14</sup>

In our study pain preceding to weakness is reported in 63.6 which is higher than reported in one study of 38 percent.<sup>15</sup> Cranial nerve involved is 27.2 percent which is lower to reported in 41%.<sup>13</sup>

During electrophysiological testing there was no particular pattern observed except that the commonest finding was abnormal f waves which was reported in 91% cases and least reported finding was reduced compound motor action potential in lower limbs which was found in only in 9.1%. During NCS studying 9% had normal NCS. Which is similar to the reported 6 – 8%.<sup>16</sup>

The average no of day to maximum weakness was around 5, which is less than reported in different studies. 7 days were reported by Van Koningsveld and 8 days by Deborah M Green.<sup>13,17</sup>

There was significant difference with the CSF protein as in this study average was 92mg/dl which in contrast to the reported 3 out of 10 patients with elevated CSF elevated protein. The obvious reason seems to be the early testing of CSF protein in the above study as CSF levels are highly dependent on the timing of testing for CSF.<sup>17,18</sup> Most studies have demonstrated beneficial response to immunotherapy in severely affected patients.<sup>19,20</sup>

There are limited studies available, showing response of immunotherapy to mild affected GBS patients and even less studies are done in Asia pacific region. Our study demonstrated a beneficial response of plasmapheresis in terms of early motor recovery of mild GBS patients which is similar to the study of 108 patients with mild disease in 3 countries Serbia, Republic of

Srpska – Bosnia and Herzegovina, Montenegro in a seven-year period which showed  $\geq 1$  on GBS Disability Scale after mean period of one month from disease onset 83% of with plasmapheresis.<sup>21</sup>

In another study, patients suffering from mild GBS who were treated with 5-day course of IVIG regained full muscle strength after 4 weeks (70% vs, 48%,  $p=0.04$ ) and the time to regain full muscle strength was shorter in the IVIG treated patients than in the untreated patients but failed to improve functional outcome after 2 weeks and also showed that 40% had residual symptoms even after 1 year. In our study there was complete recovery of muscle strength with plasmapheresis. We did not use IVIG as treatment option due to cost issue.<sup>11</sup>

Our study showed no difference in recovery with increased number of sessions of plasmapheresis. 3 sessions were enough to show a statistically significant recovery. Another study done by the French cooperative group also showed that two PE sessions significantly shortened the time to onset of motor recovery (4 days) than supportive care (8 days) and shortened the time to hospital discharge (13 vs. 18 days).<sup>7</sup>

Currently the International GBS Outcome Study, a multicenter prospective cohort study on GBS is an ongoing trial investigating treatment in patients with mild GBS and is expected to publish its results in 2024.<sup>22</sup>

There are a few limitations of our study as sample size is small and there is no comparison available with IVIG. This is due to high cost of this treatment option.

## Conclusion

Clinical characteristics for mild GBS are similar to those moderate to severe cases. Patients with mild disease may advise use of treatment like plasmapheresis to hasten early recovery. However, larger prospective randomized control trials are needed to be conducted in future.

**Ethical Approval:** The Institutional Review Board, KEMU approved the study vide letter No. 1053/ RC/ KEMU.

**Conflict of Interest:** The authors declare no conflict of interest.

**Funding Source:** None

**Authors' Contribution:**

**AT:** Conception & design, critical revision for important intellectual content, final approval

**SB:** Conception & design, analysis & interpretation of data, drafting of article, critical revision for important intellectual content, final approval

**AA:** Conception & design, data collection

**SAH:** Analysis & interpretation of data, drafting of article

**RI:** Conception & design, drafting of article

**AN:** Analysis & interpretation of data, critical revision for important intellectual content, final approval

**References**

- Leonhard SE, Mandarakas MR, Gondim FA, Bateman K, Ferreira ML, Cornblath DR, van Doorn PA, Dourado ME, Hughes RA, Islam B, Kusunoki S. Diagnosis and management of Guillain-Barré syndrome in ten steps. *Nature Reviews Neurology*. 2019;15(11):671-83.
- Sejvar, J. J., Baughman, A. L., Wise, M. & Morgan, O. W. Population incidence of Guillain-Barré syndrome: a systematic review and meta-analysis. *Neuroepidemiology*. 2011; 36(1): 123–133.
- van den Berg B, Walgaard C, Drenthen J, et al. Guillain-Barré syndrome: pathogenesis, diagnosis, treatment and prognosis. *Nat Rev Neurol* 2014; 10(1):469–82
- Verboon C, Doets AY, Galassi G, Davidson A, Waheed W, Péréon Y, Shahrizaila N, Kusunoki S, Lehmann HC, Harbo T, Monges S. Current treatment practice of Guillain-Barré syndrome. *Neurology*. 2019;93(1): e59-76.
- Al-Hakem H, Sindrup SH, Andersen H, et al. Guillain-Barré syndrome in Denmark: a population-based study on epidemiology, diagnosis and clinical severity. *J Neurol* 2019; 266(1):440–9
- Verboon C, Harbo T, Cornblath DR, Hughes RA, Van Doorn PA, Lunn MP, Gorson KC, Barroso F, Kuwabara S, Galassi G, Lehmann HC. Intravenous immunoglobulin treatment for mild Guillain-Barré syndrome: an international observational study. *Journal of Neurology, Neurosurgery & Psychiatry*. 2021;92(10):1080-8.
- French Cooperative Group on Plasma Exchange in Guillain-Barré Syndrome. Appropriate number of plasma exchanges in Guillain-Barré syndrome. *Annals of neurology*. 1997;41(3):298-306.
- Al-Hakem H, Sindrup SH, Andersen H, et al. Guillain-Barré syndrome in Denmark: a population-based study on epidemiology, diagnosis and clinical severity. *J Neurol* 2019;266(1): 440–9
- Van Koningsveld R, Schmitz PIM, Ang CW, et al. Infections and course of disease in mild forms of Guillain-Barré syndrome. *Neurology* 2002;58(1): 610–4.
- Peric S, Basta I, Berisavac I, Stojiljkovic O, Lukic S, Dominovic-Kovacevic A, Djordjevic G, Martic V, Petrovic M, Vujovic B, Jovanovic D. Effects of immunotherapy in mild Guillain-Barre Syndrome. *Journal of the Neurological Sciences*. 2017 ; 381(1):829.
- JC CV, Harbo T, R Cornblath D, AC Hughes R, PA PV, P Lunn M, C Gorson K, Barroso F, Kuwabara S, Galassi G, C Lehmann H. Intravenous immunoglobulin treatment for mild Guillain-Barré syndrome. *Journal of Neurology, Neurosurgery and Psychiatry*. 2021; 92(10):1080-8
- Winer JB, Hughes RA, Osmond C. A prospective study of acute idiopathic neuropathy. I. Clinical features and their prognostic value. *J Neurol Neurosurg Psychiatry* 1988; 51(1):605–12.
- Van Koningsveld R, Van Doorn PA, Schmitz PI, et al. Mild forms of Guillain-Barré syndrome in an epidemiologic survey in The Netherlands. *Neurology* 2000; 54(1):620–5.
- Kenan G, Kushnir M, Leonov Y, Ilgiyaev E, Aroesty R, Bhonkar S, Kimiagar I, Armon C. Electrophysiological features and prognosis of Guillain-Barré syndrome in Israel: A single-center's 20 years' experience. *Journal of the Neurological Sciences*. 2020 ; 417(1):117074.
- Ruts L, Drenthen J, Jongen JL, Hop WC, Visser GH, Jacobs BC, Van Doorn PA, Dutch GBS Study Group. Pain in Guillain-Barre syndrome: a long-term follow-up study. *Neurology*. 2010;75(16):1439-47.
- JC CV, Harbo T, R Cornblath D, AC Hughes R, PA PV, P Lunn M, C Gorson K, Barroso F, Kuwabara S, Galassi G, C Lehmann H. Intravenous immunoglobulin treatment for mild Guillain-Barré syndrome. *Journal of Neurology, Neurosurgery and Psychiatry*. 2021; 92(10): 1080-8.
- Green DM, Ropper AH. Mild Guillain-Barré syndrome. *Archives of Neurology*. 2001 ;58(7):1098-101.
- Fokke C, van den Berg B, Drenthen J, Walgaard C, van Doorn PA, Jacobs BC. Diagnosis of Guillain-Barré syndrome and validation of Brighton criteria. *Brain*. 2014;137(1):33-43.
- Korinthenberg R, Trollmann R, Felderhoff-Müser U, Bernert G, Hackenberg A, Hufnagel M, Pohl M, Hahn G, Mentzel HJ, Sommer C, Lambeck J. Diagnosis and treatment of Guillain-Barré Syndrome in childhood and adolescence: An evidence-and consensus-based guideline. *European Journal of Pediatric Neurology*.

- 2020;25(1): 5-16.
20. Shahrizaila N, Lehmann HC, Kuwabara S. Guillain-Barré syndrome. *The Lancet*. 2021 ; 397 (10280): 1214-28.
  21. Peric S, Basta I, Berisavac I, Stojiljkovic O, Lukic S, Dominovic-Kovacevic A, Djordjevic G, Martic V, Petrovic M, Vujovic B, Jovanovic D. Effects of immunotherapy in mild Guillain-Barre Syndrome. *Journal of the Neurological Sciences*. 2017;381(1): 829.
  22. Jacobs BC, van den Berg B, Verboon C, Chavada G, Cornblath DR, Gorson KC, Harbo T, Hartung HP, Hughes RA, Kusunoki S, van Doorn PA. International Guillain-Barré Syndrome Outcome Study: protocol of a prospective observational cohort study on clinical and biological predictors of disease course and outcome in Guillain-Barré syndrome. *Journal of the Peripheral Nervous System*. 2017;22(2):68-76.
-