ORIGINAL RESEARCH PAPER

Volume-7 | Issue-8 | August-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CLINICAL PROFILE AND PREDICTORS OF OUTCOME IN GUILLIAN BARRE SYNDROME- A SOUTH INDIAN STUDY

General Medicine

Anjana Gopal Senior resident , Department of Medicine, Govt. Medical College, Calicut.

Geetha P* Professor of Medicine, Govt medical college , Calicut *Corresponding Author

P K Sasidharan Former Head of the Department of Medicine, Govt medical college Calicut

ABSTRACT

Background and Aim: Guillain–Barre syndrome (GBS) is an immune mediated polyradiculoneuropathy, with variable clinical profile and outcome. We analysed the clinical profile, and the factors predictive of need for mechanical ventilation and 3 month functional outcome in patients with Guillian Barre syndrome .

Materials and methods- We prospectively recruited patients with Guillian barre syndrome admitted in the Department of General Medicine and Neuromedicine according to the Asbury Cornblath criteria for Guillian Barre syndrome. The clinical , demographic characteristics ,electrophysiological parameters and 3 month outcome were assessed. The poor outcome was defined as Hughes Motor Scale of more than or equal to three at three months follow up.

Results - Of the 61 patients (Mean age 40 ± 14.9 years) recruited, 39 were males. On univariate analysis, the factors significantly, associated with poor functional outcome at 3 months were neck flexor weakness($p<0.001$), respiratory paralysis($p<0.001$),autonomic dysfunction($p<0.001$), time to peak deficit <7days($p=0.015$) , MRC sum score <30 ($p<0.001$) and axonal pattern in electrophysiological studies($p<0.001$). The predictors of need for mechanical ventilation were neck muscle weakness ($p<0.001$), cranial nerve 9 and 10 palsy ($p=0.033$) , autonomic dysfunction ($p<0.001$) , MRC sum score <30 ($p<0.001$) and axonal pattern on NCS($p<0.001$) . On multivariate analysis, respiratory paralysis was the independent predictor of poor functional outcome at 3 months

Conclusion – Detailed evaluation of the clinical and electrophysiological profile may help in predicting the functional outcome and need for mechanical ventilation in patients with GBS.

KEYWORDS

Guillian Barre Syndrome, Hughes Motor Scale, Asbury Cornblath Criteria.

Introduction

Guillain–Barre syndrome (GBS) is an immune mediated polyradiculoneuropathy, with axonal damage or demyelination. Clinically it is a monophasic illness characterised by acute onset, areflexic quadriparesis with or without bulbar palsy and sometimes leading to weakness of respiratory muscles thus requiring mechanical ventilatory support [1]. This clinical entity usually manifests with variable severity and outcome. Previous studies have shown that autonomic dysfunction ,neck flexor weakness, need for mechanical ventilation, medical research council (MRC) sum score<30 on admission and axonal pattern on electrophysiological testing is found to be significantly associated with poor outcome [2]. Mechanical ventilation is required in around 20–30% of patients with GBS, especially in patients who show rapid progression of weakness, autonomic dysfunction, bulbar palsy, and bilateral facial weakness, and is associated with poor functional outcome [3] .

There are various studies among the western population analyzing the varied clinical presentation of GBS . But there are hardly any studies from Northern Kerala. In this study we analysed the clinical profile of GBS , the various factors associated with poor functional outcome and predictors of the need for mechanical ventilation. We analyzed the clinical profile and the factors predictive of need for mechanical ventilation and 3 month functional oucome in patients with Guillian Barre syndrome,

Materials and Methods

The study was a prospective observational study of 61 patients with Guillian Barre Syndrome admitted in the Department of Medicine and Department of Neuromedicine , Government medical College, Calicut from January 1st 2015 to December 31st 2015. Patients who fulfilled the Asbury and Cornblath criteria were included in the study. The **Major Criteria** were 1. Progressive weakness of both arms and legs due to neuropathy , 2. Areflexia, 3. Disease course less than 4 weeks and **Supportive Criteria** 1. Relative symmetric weakness, 2. No sensory symptoms/signs- if at all only subjective sensory symptoms or signs ,3. Cranial nerve involvement, especially bilateral facial weakness, 4. Autonomic dysfunction,5. Absence of fever at onset, 6. High concentration of protein in CSF, 7. Electrophysiological evidence of demyelination, and 8. Absence of another cause for similar manifestations. Patients with Metabolic disturbances like hypokalemia, hypophosphatemia, hypermagnesemia, hypoglycaemia, Vasculitis, SLE, polyarteritis nodosa, Toxins(lead), botulism, organophosphates ,Porphyria, Drug induced neuropathy, Critical illness neuropathy, Myasthenia gravis, Compressive radiculomyelopathy, Transverse myelitis , Poliomyelitis were excluded.

The demographic ,clinical profile and electrophysiological parameters were collected. The nerve conduction study(NCS) and cerebrospinal fluid analysis(CSF) results were noted. The patients were given treatment with IVIG or plasmapheresis and followed up to a period of 3 months. MRC(medical research council) sum score was used as a measure of the disability of the patient. The functional status of the patient was assessed by **Hughes Motor Scale(HMS)** at 3 months. HMS is a functional grading scale ranging from 0-6(0—asymptomatic, 1— mild signs or symptoms but able to run, 2—able to walk unaided for 5 m, 3—able to walk 5 m with support, 4—bed-ridden or wheel-chair bound, 5—requiring ventilatory assistance, 6—death). To assess parameters associated with functional outcome , patients were divided into 2 groups based on Hughes motor scale at 3 months: those with HMS<3(suggesting ability to walk unaided at 3 months) represented the "good outcome" group and those with HMS >= 3(suggesting inability to walk unaided at 3 months) represented the "poor outcome" group.

Statistical analysis

The data was entered in excel and analysed using SPSS software. Both univariate and multivariate analyses were done to evaluate the factors affecting outcome of GBS according to the Hughes motor scale as well as factors associated with respiratory failure. Univariate analysis was performed by Chi-square test for nonparametric data .For multivariate analysis, binary logistic regression was performed to see the impact of individual factors affecting outcome. Statistical significance was defined at p value of <0.05.

Results

Of the 61 patients with GuillianBarre syndrome (Mean age 40 ± 14.9(SD)) included in the study, 39 were males. Of them, 35(57.3%) of patients had preceeding illness. Of the 61 patients included in the study , 16 (26%) patients had respiratory infection , 10(16%) patients had diarrhea ,fever 9(15%) and 26(43%) patients did not have any antecedent events. The mean MRC sum scores on admission, nadir and 3 months were 39±12, 33±14 and 48±10. Fifty three patients progressed to peak deficit within the first 7 days. Those who progressed

rapidly had more severe weakness(p= 0.03).The clinical profile of the study group is given in the table1.

Cranial nerve involvement was seen in 37(60.6%) patients. Facial nerve was the most common cranial involved . There were six cases of Miller Fischer syndrome. Of the 61 patients enrolled in the study, 22 (36%) patients developed respiratory paralysis. All these 22 patients were mechanically ventilated. On nerve conduction study(NCS), 48% patients had demyelinating pattern and 42% had axonal pattern. There was a significant association between preceeding diarrheal illness and axonal pattern on NCS(p==0.05). CSF analysis was done at the end of first week, and albuminocytological dissociation was demonstrated in 90% of cases. Eighty percent of cases were treated with IVIG. Plasmapheresis was given in patients who could not afford IVIG or those who had progression of symptoms after completion of IVIG. Four patients died and all the deaths were due to autonomic dysfunction. And incomplete recovery was seen in 82% of our patients and rest made a complete recovery.

Table 1: showing the clinical profile of patients

Characterestics	N(%)
Mean age (±SD)	40±14.9
Sex ratio (Male:Female)	39:22
Time to peak deficit 1-7days 8-14days 15- 21days Mean time to peak deficit (days) ±SD	 53(86.8) 6(9.8) 2(3.2) 7± 2
Antecedent events Respiratory infection Diarrhoea Exanthematous fever None	 16(26) 10(16) 9(15) 26(43)
Autonomic dysfunction	19(31.1)
Cranial nerve involvement	37(60.6)
Facial palsy	34(55.7)
Bulbar palsy	5(8.1)
Miller Fischer variant	6(9.8)
Ventilatory support	22 (36%)
Neck flexor weakness	22 (36%)
Areflexia	61(100)
Electrophysiology Demyelinating Axonal Normal	 29(48) 26(42) 6(10)
Treatment IVIG Plasma exchange Supportive	 49 8 4
Outcome Death Incomplete recovery Complete recovery	 4(7) 50(82) 7(11)

At three months, thirty seven (60.6%) patients had a good outcome. The factors predicting outcome at 3 months were analysed and the results of the univariate analysis is given in table 2.

On univariate analysis, the predictors of the need for mechanical ventilation were muscle weakness (p<0.001), cranial nerve 9 and 10 palsy (p=0.033) , autonomic dysfunction (p<0.001) , MRC sum score <30 (p<0.001) and axonal pattern on NCS(p<0.001) (table 3).

On multivariate analysis, respiratory paralysis was the independent predictor of poor outcome at 3 months.

Table 2 : showing the factors predicting outcome at 3 months

Variables	Good outcome N=37 (60%)	Bad outcome N=24(40%)	P value
Time to peak deficit <7days	29(54.7)	24(45.3)	P=0.015
MRC <30	2(10.5)	17(89.5)	P<0.001
Neck flexor weakness	1(4.5)	21(95.5)	P<0.001
Autonomic dysfunction	0	19(100)	P<0.001
Respiratory paralysis	1(4.5)	21(95.5)	P<0.001
Axonal pattern on NCS	6(24)	19(76)	P<0.001

Table 3 : showing the predictors of mechanical ventilation

Mechanically, ventilated, Variables	Yes N=22(36%)	No N=39(64%)	P value
Time to peak deficit <7days	21(40)	32(60)	P<0.001
MRC <30	16(82)	3(18)	P=0.1
Neck flexor weakness	22(100)	0	P<0.001
Autonomic dysfunction	19(100)	0	P<0.001
Bulbar palsy	4(80)	1(20)	P=0.03
Axonal pattern on NCS	18(72)	7(28)	P<0.001

Discussion

In our study, there was a male preponderance in the occurance of GBS, with 39 out of the 61 cases being male. This is similar to the results from previous studies by Verma et al[2] and Dhadke et al[5]. Hiraga et al found that AMAN Variant was associated with enteritis and upper respiratory infection with demyelinating type of GBS. In our study also ,we found a statistically significant association between axonal type of GBS and diarrheal illness(P<0.05).

Cranial nerve involvement was seen in 37(60.6%) patients in our study population. From previous studies, cranial nerve involvement was seen in 30% patients according to Verma et al and 50% of patients in Loefel rossi et al[7]. Similarly a higher incidence of respiratory paralysis was seen in our patients 36% vs 16.7% in Verma et al . In patients with respiratory paralysis, neck muscle weakness was invariably present. The incidence of bulbar palsy ,bifacial palsy, autonomic dysfunction and neck flexor weakness among different studies is compared in table4.

The annual incidence of Miller Fischer Syndrome in the general population is 1 per one million. But we had six patients with Miller Fischer in our study group, which was higher than the incidence in the general population. On electrophysiological evaluation, demyelination was the most common NCS pattern observed.

Table 4: showing the incidence among ventilated patients

	Our study	Verma et al[2]	Durand et al[8]	Paul et al[3]
Bulbar palsy	26%	86%	38%	92%
Autonomic dysfunction	86%	100%		
Neck flexor weakness	100%	100%		92%
Bifacial palsy	86%	66%		96%

Out of the 61 patients, 50 (82%) made an incomplete recovery,7 (11%) patients made a complete recovery and 4(7%) patients died. The comparison with other studies is given in table 5.

Even though 80% of our patients were treated with IVIG only 11% made a complete recovery when compared with 30% patients in the study by Verma et al, in which only 14% of patients were treated with IVIG(table 5).

Table 5: showing the comparison of outcome of patients with other studies

	Our study	Verma et al[2]	Dhadke et al[3]
Complete recovery	11%	30%	75%
Incomplete recovery	82%	63%	5%
Death	7%	6.8%	20%
Treatment with IVIG	80%	14%	35%

The factors significantly, associated with poor functional outcome at 3 months were neck flexor weakness(p<0.001), respiratory paralysis(p<0.001),autonomic dysfunction(p<0.001), time to peak deficit <7days(p=0.015) , MRC sum score <30 (p<0.001) , axonal pattern in NCS(p<0.001) and treatment (p<0.001).Miller Fischer Variant was significantly associated (p=0.03) with good functional outcome at 3 months. And respiratory muscle paralysis was the independent predictor of poor functional outcome. In the study by Verma et al, similar to the results in our study, they also observed that autonomic dysfunction(p=0.013) , neck flexor weakness(p=0.009),

mechanical ventilation($p<0.001$), axonal pattern in NCS (0.001)and MRC<30 ($p<0.001$) were associated with poor functional outcome. Another study by Walgaard et al found that higher age, preceeding diarrheal illness and low MRC score on admission and at 1 week were independently associated with inability to walk at 4 weeks, 3 months and 6 months [12]. In a Dutch trial by Visser and co workers [13], they found that factors associated with poor outcome at 6 months included age >50years, recent cytomegalovirus infection , recent gastrointestinal infection, MRC score <40 and initial rapid progression of weakness.

We also tried to find the predictors of the need for mechanical ventilation. On univariate analysis , neck muscle weakness ($p<0.001$), cranial nerve 9 and 10 palsy ($p=0.033$) , autonomic dysfunction ($p<0.001$) , MRC sum score <30 ($p<0.001$) and axonal pattern on NCS($p<0.001$) were found to be predictors of the need for mechanical ventilation. In a trial by Paul et al[3], the factors associated with need for mechanical ventilation were simultaneous weakness of upper (UL) and lower (LL) limbs as the initial symptom ($P<0.001$); UL power less than Grade 3/5 at nadir ($P<0.001$); presence of neck and bulbar weakness ($P<0.001$); shorter duration from onset to bulbar weakness and confinement to bed ($P=0.001$) and bilateral facial involvement ($P<0.01$).

Conclusions

Since GBS is a disease with varied clinical presentation, there is a significant geographic variability in the presentation of the disease. Our study has brought out the clinical profile of GBS in our setting. The factors like neck muscle weakness , cranial nerve 9 and 10 palsy , autonomic dysfunction and severe weakness at onset should be taken as warning signs of impending respiratory paralysis. Our results show that early onset of bulbar palsy and neck muscle weakness should be carefully examined and periodically assessed in patients of GBS as it predicts the need for assisted ventilation.

Even though the course of the disease and its response to treatment is unpredictable , it is seen that impending respiratory paralysis can be predicted to some extent by these parameters.

While working in a resource limited country like India , prompt referral and early initiation of treatment of patients with impending respiratory paralysis may improve outcome.

References

1. Asbury AK, Cornblath DR. Assessment of current diagnostic criteria for Guillain–Barré syndrome. Ann Neurol 1990;27:S21–4.
2. Verma R, Chaudhari TS, Raut TP, Garg RK. Clinico-electrophysiological profile and predictors of functional outcome in Guillain-Barre syndrome (GBS). J NeurolSci. 2013 Dec 15;335(1-2):105-11. doi: 10.1016 /j.jns.2013.09.002. Epub 2013 Sep10. PubMed PMID: 24064258.
3. Paul BS, Bhatia R, Prasad K, Padma MV, Tripathi M, Singh MB. Clinical predictors of mechanical ventilation in Guillain-Barré syndrome. Neurol India.2012 Mar-Apr;60(2):150-3. doi: 10.4103/0028-3886.96383. PubMed PMID: 22626694.
4. John J, Kannan A. Clinical profile of Guillain Barre syndrome in a tertiary care centre. Int J Res Med Sci 2014;2:445-7.
5. Dhadke SV, Dhadke VN, Bangar SS, Korade MB. Clinical profile of Guillain Barre syndrome. J Assoc Physicians India. 2013 Mar;61(3):168-72. PubMed PMID: 24475678.
6. Kannan MA, Ch RK, Jabeen S A, Mridula K R, Rao P, Borgohain R. Clinical, electrophysiological subtypes and antiganglioside antibodies in childhood Guillain-Barré syndrome. Neurol India 2011;59:727-32
7. Loffel VB, Rossi LN, Mumenyhaler M. The Landry Gullian Barre Syndrome complication prognosis and natural History of 123 cases. J Neural SG 1977;33:71-79
8. Durand MC, Porcher R, Orlikowski D, Clair CD, Annane D, JeanLouis Gaillard JL et al. Clinical and electrophysiological predictors of respiratory failure in Guillain-Barre Syndrome: a prospective study. The Lancet Neurology 2006;5:1021-1028
9. Kalita J, Misra UK, Das M. Neurophysiological criteria in the diagnosis of different clinical types of Guillain-Barre syndrome. J Neurol Neurosurg Psychiatry. 2008 Mar;79(3):289-93. Epub 2007 Jul 5. PubMed PMID: 17615164
10. Gupta D, Nair M, Baheti NN, Sarma PS, Kuruvilla A; Diplomate-American Board. Electrodiagnostic and clinical aspects of Guillain-Barré syndrome: an analysis of 142 cases. J Clin Neuromuscul Dis. 2008 Dec;10(2):42-51. doi:10.1097/CND.0b013e31818e9510. Erratum in: J Clin Neuromuscul Dis. 2009 Mar;10(3):137. Deepak, Gupta [corrected to Gupta, Deepak]; Muraleedharan, Nair [corrected to Nair, Muraleedharan]; Sarma, Sankara P [corrected to Sarma, P Sankara]; Abraham, Kuruvilla [corrected to Kuruvilla, Abraham]. PubMed PMID:19169089
11. Zain Fakih, Duncan Khanikar, Chitralekha Baruah, Marami Das. A Clinical Study of Prognostic Factors of Guillain Barré Syndrome in a Tertiary Care Hospital of North-East India. Int J Med Res Prof. 2016, 2(2); 170-76.
12. Walgaard C, Lingsma HF, Ruts L, Drenthen J, van Koningsveld R, Garssen MJ, van Doorn PA, Steyerberg EW, Jacobs BC. Prediction of respiratory insufficiency in Guillain-Barré syndrome. Ann Neurol. 2010 Jun;67(6):781-7. doi:10.1002/ana.21976. PubMed PMID: 20517939.
13. 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 Oct 19;75(16):1439-47. doi: 10.1212/WNL.0b013e3181f88345.Epub 2010 Sep 22. PubMed PMID: 20861454.