Original Article

Clinical Profile of Guillain Barre' Syndrome-Observations from a Tertiary Care Hospital of Bangladesh

Habib R[a], Saifuddin M[b], Islam R[c], Rahman A[d], Bhowmik NB[e], Haque MA[f]

Abstract

Background: *Guillain-Barré syndrome (GBS) is the commonest cause of acute flaccid paralysis worldwide, with an incidence of 0.6-4 per 100.000 inhabitants per year. It affects all age groups and carries an incapacity burden of up to 20%. The aims of this study were to evaluate the demographic and clinical presentation, hospital care and outcome with different modalities of treatment in adult patients suffering from GBSadmittedina tertiary care hospital in Dhaka.*

Methods: *This observational study was done in the Neurology department of a tertiary care hospital in Dhaka.The studystarted in July-2011 and the first fiftypatients suffering from GBSwereenrolledconsecutively. Subjects included in this study were>18years of age.All the patients were interviewed and clinically examined. Relevant data were documented in a structured questionnaire. Nerve conduction Study (NCS) and Cerebrospinal fluid (CSF) study results were also documented. All of patients were watched for respiratory insufficiency and those who developed respiratory paralysis were transferred to ICU for respiratory assistance. According to clinical and electrophysiological criteria, the patients were classified into different variants of GBS. Patients were treated with intravenous immunoglobulin (IVIg), plasmapheresis, supportive care and outcome was observed. The patient who recovered and were discharged were later followed up on out –patientbasis for one month.*

Results: *The commonest age group affected was 31-50 yrs with male preponderance .The mean age of study subjects was 46years. In most of the patient their weakness progressed for 3-5 days. Clinical evidence of a preceding infection was present inforty-six percent of the patientsbutcausative organism was not identified.Clinical presentations were quadriparesis in 84 % of patients, cranial nerve palsy in 48% of patients. Severe respiratory involvement requiring mechanical ventilation developed in 10% of patientsafter admission. CSF study was done and only10 subjects displayed typical findings of albumino cytological dissociation. NCS wasabnormal in all study subjects and revealed Acute Motor Sensory Axonal Neuropathy (AMSAN) in58%of study population. Among the fifty patients 23received plasmapheresis and another 9 receivedstandard IVIg therapy. Of these patients 20(88%) and 7 (77.6%) patients made significant recovery, respectively. Residual neurodeficit persisted in 6 of the remaining patients who received treatment in the form of only physiotherapy at the end of one month follow-up.*

Conclusion: *Rapidly progressive quadriparesis with cranial nerve involvement was the commonest presentation. In this group of patients NCS proved to be a sensitive study for early diagnosis of patients with GBS in both diabetic and non-diabetic population. The axonal variety of GBS was more common than the demyelinating type. Although not statistically significant, the better response to plasmapheresis seemedencouraging. Again the patients who received IVIg or plasmapheresis early in the course of disease had faster recovery as compared to patients who received only supportive line of treatment.*

Key words: *Guillain Barre' Syndrome, Nerve conduction Study, Acute Inflammatory Demyelinating Polyneuropathy, Acute Motor Axonal Neuropathy, Acute Motor Sensory Axonal Neuropathy, Miller-Fisher syndrome, plasma exchange/plasmapheresis, IVIg*

(BIRDEM Med J 2017; 7(1): 38-42)

Author Informations

a. Dr. Rumana Habib, Assistant Professor, Department of Neurology, BIRDEM General Hospital, Dhaka
b. Dr. Md. Saifuddin, Assistant Registrar, Department of Neurology, BIRDEM General Hospital, Dhaka
c. Dr. Rashedul Islam, Registrar, Department of Neurology, BIRDEM General Hospital, Dhaka
d. Dr. Aminur Rahman, Consultant Department of Neurology, BIRDEM General Hospital, Dhaka
e. Dr. Nirmalendu Bikash Bhowmik, Professor, Department of Neurology, BIRDEM General Hospital, Dhaka
f. Dr. Md. Amirul Haque, Professor & Head, Department of Neurology, BIRDEM General Hospital, Dhaka

Address of correspondence: Dr. Rumana Habib, Assistant Professor, Department of neurology, BIRDEM General Hospital, Dhaka, E-mail: drhrumana4@gmail.com

Received: November 12, 2015 **Accepted:** November 30, 2016

Introduction

Guillain Barre' Syndrome (GBS) is an acute, polyradiculo- neuropathy of autoimmune nature.[1] GBS occurs throughout the world with a median annual incidence of 1.3 cases per population of 100, 000 with men being more frequently affected than women.

Typical clinical features of GBS are progressive, symmetrical muscle weakness associated with absent or depressed deep tendon reflexes. The weakness is very variable ranging from mild difficulty in walking to complete paralysis of all four extremities, motor cranial weakness to life-threatening respiratory muscle

weakness. The later develops in 10 to 25% of patients necessitating ventilatory support.[2]GBS also affects autonomic nervous system and dysautonomia may occur in up to 70% of patients.

A considerable body of evidence points to an organ-specific autoimmune disorder mediated by auto reactive T cellsand humoral antibodies to still incompletely characterized peripheral nerve antigens [3]. A preceding infection may trigger an autoimmune response through molecular mimicry in which the hostgenerates an immune response against an infectious organism that shares epitopes with the host's peripheral nerves. Campylobacter jejuni, cytomegalovirus, Epstein-Barr virus and Mycoplasma pneumoniae are commonly identified antecedent pathogens.[4]

Acute Inflammatory Demyelinating Polyneuropathy (AIDP) is by far the most common form of GBS in Europe and North America. Acute Motor Axonal Neuropathy (AMAN) andAcute Motor Sensory AxonalNeuropathy (AMSAN) subtypes constitute 30–40% of cases in Asia and South America but are rare in the Western world.[5]The Miller-Fisher syndrome (MFS), which accounts for 5% of cases, is characterized by ophthalmoplegia, ataxia, and areflexia. Patients present with diplopia followed by gait and limb ataxia.[6]

Diagnosis of GBS is usually clinical. Diagnostic criteria for GBS from the National Institute of Neurological Disorders and Stroke (NINDS)[7] have an important role in research and are widely used in clinical practice. Cerebrospinal fluid (CSF) analysis show albuminocytologic dissociation at one week after onset of symptoms. Nerve conduction studies when available should be performed to confirm diagnosis.

Treatment of GBS is subdivided into: (i) the management of severely paralyzed patients with intensive care and ventilatory support; and (ii) specific therapeutic interventions aimed at mitigating the harmful effects of autoantibodies, such as IVIg infusion and plasma exchange that shorten the progressive course of GBS and aid rapid resolution of the disease.[8]

Therapeutic plasma exchange/plasmapheresis is recommended for patients with moderate to severe weakness (defined as the ability to walk only with support or worse). Benefits are clearestwhen plasma exchange is begun within 2 weeks of onset.The recommended plasmapheresis schedule entails a seriesof five exchanges (40-50 mL/kg) with a continuous flowmachine on alternate days using saline and albumin asreplacement fluid. The Cochrane review confirmed the value of plasma exchange over supportive therapy in hastening the recovery from GBS when started within 30 days after disease onset.[9]Three randomized trials comparing IVIgwith plasmaexchange demonstrated the benefit of five daily infusions ofIVIg (0.4 g/kg/day) given in the first 2 weeks ofthe disease[10] There was no advantage of usingboth together. These findings were confirmed by anotherCochran systematic review.[11]

The prognosis of GBS is generally favorable. Approximately 80 and 84 percent patients with GBS walk independently at six months and one year after diagnosis, respectively.[12]

In this study ,we tried to evaluate the presentation, types and treatment outcome among both diabetic and non-diabetic patients admitted under Neurology department of a tertiary care hospital inDhaka, Bangladesh.

Methods

This observational study was done in department ofneurology of a tertiary care hospital inDhaka. The study started in July-2011 and the first fifty patients were enrolled. Subjects included in this study were>18years of age.All the patients were interviewed and clinically examined. Nerve conduction Study (NCS) and C.S.F examination were done.NCS reports were reviewed by two neurologists and assigned a classification based on the criteria published by the Plasma Exchange/ Sandoglobulin Guillain–Barré Syndrome Trial Group.Nerve conduction Study (NCS) and C.S.F examination results weredocumentedina structured questionnaire. All patients were watched for respiratory insufficiency and those who developed respiratory paralysis were transferred to ICU and givenrespiratory assistance. Signs of impending respiratory failure included deterioration in forced vital capacity (FVC), declining maximal respiratory pressures and hypoxemia caused by atelectasis. Serial measures of decline in respiratory function that couldpredict future respiratory failure included vital capacity of lessthan 20 mL/kg or a decline by 30% from baseline, maximal inspiratory pressure less than 30 cm and maximal expiratoryrespiratory pressure of less than 40 cm H2O.According to clinical and electrophysiological criteria, the patients were classified into different varieties of GBS. Patients were treated with IVIG/ plasmapheresis /supportive care and outcome was

observed.Patient who recovered and discharged were followed up on out -patient (OPD) basis for one month.Relevant data were abstracted and documented in structured case-record forms. Results were presented in tables and figures.

Results

This study was done on the first 50 patients who fulfilled criteria for GBS and had no immediate respiratory insufficiency on admission .The mean age of the study population was 46 years(range 21-63). Males were 28 and females 22. Among the study subjects most of the patients were diabetic (N=32, 64%).Age distribution of study population is shown in Fig-I.

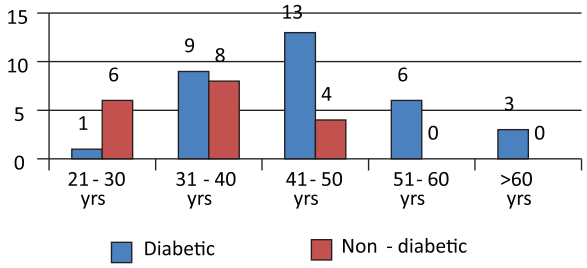

Figure I. *Agedistribution of diabetic and non-diabetic study populationwithGBS(N=50)*

The major clinical manifestation was ascending weakness that evolved more or less symmetrically over a period of several days to a week. Reduced or absent tendon reflexes were consistent findings. Cranial nerve involvement wasmore frequent.Respiratory support was required for 5 (10%) patients. Other features are presented in Table-I.

Table I. Clinical Features of study population with GBS (N=50)

Clinical presentation[a]	Total	Percentage
Quadriparesis	42	84
Paraparesis	8	16
Cranial nerve palsy	24	48
Autonomic involvement	4	8
Sensory involvement	19	38
Respiratory paralysis[b]	5	10

a. All patients had more than one clinical finding
b. Signs of impending respiratory failureinclude vital capacity of less than 20 mL/kg or a decline by 30% from baseline, maximal inspiratory pressure less than 30 cm, and maximal expiratory respiratory pressure of less than 40 cm of H_2 0 and hypoxia.

In majority of the GBS patientstheir weakness reached a maximum peak within 3-5 days of illness. Mean time to maximal weakness was 4.2 days (range 1–12 days).Rate of evolution in other cases are shown in |Table II.

Table II. Rate of evolution ofweakness (time to maximal weakness) in study population with GBS (N=50)

	No of patients
<3 days	4
3-5 days	38
6-10	4
>10 days	4

Clinical evidence of a preceding infection was present in forty-six percent of the patients. The most frequent symptom was diarrhea (50%) but causative organism was not identified. Respiratory infection was encountered in 4 and urinary tract infection in 3 patients.

CSF study done in 30 patients of study population showed albuminocytologic dissociation in only 10subjects.

All study subjects underwent NCS earliest within the five days after the onset of symptoms.Electro physiologic studies showed that 86% of patients had an axonal variant of GBS. Other electrophysiological types of GBS shown in Fig -2.

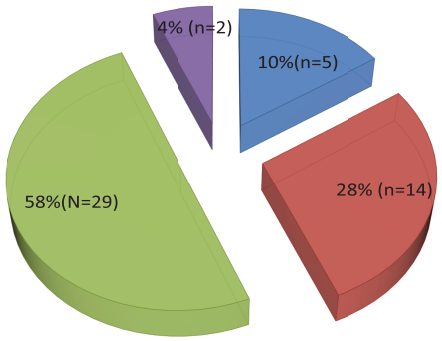

Figure 2: *Electrophysiological abnormalities in the study population (n=50)*

AIDP, Acute Inflammatory Demyelinating Polyneuropathy, AMAN, Acute Motor Axonal Neuropathy, AMSAN, Acute Motor Sensory Axonal Neuropathy, MFS, Miller Fisher Syndrome

AMSAN variant of GBS affected 22 (68.75%) diabetic patients and 7(21.8%) non-diabetic patients and was more common than the acute inflammatory demyelinating polyneuroathy (AIDP) form.

All patients received definitive therapy in the form of plasmapheresis,IVIg therapy and physiotherapy. Plasmapheresiswas done in 23(46 %) patients.Standard intravenous immunoglobulin therapy (0.4 g /kg /day for 5 consecutive days) could be given to 9 patients (18%).Rest 18 patients received only supportive treatment in the form of physiotherapy .These patients were followed up during their hospital stay and most up to 30 days by passive surveillance .Significant improvement occurred in 20(88%)who received plasmapheresis and 7 (77.6 %)who received IVIg.6 patients who had received physiotherapy only had severe neurodeficit which persisted at the end of one month follow-up.

Discussion

GBS is a treatable disease which is associated with morbidity and mortality if untreated[13]. GBS will become increasingly important in Bangladesh and other developing countries as recognition of the clinical profile can lead to early investigation, validation of diagnosis and treatment in the early course of disease.

The commonest age group affected by GBS in our study was 31-60 years and their mean age was 46 years which follows the trends in incidence rates by age worldwide. There was malepredominance (1.7:1) and this corresponded to the increased risk of GBS in male worldwide.[14]

Antecedent event preceded GBS in almost 46% cases but responsible organism could not be identified.GBS in Bangladesh is frequently preceded by an enteric infection caused by *Campylobacter jejuni.*[15]Studies in Western countries have reported evidence of recent infection with *Campylobacterjejuni* in 15% to 40% of GBS cases and with cytomegalovirus (CMV) in 5% to 20% of cases. Recent infection with Epstein-Barr virus (EBV) or *Mycoplasma pneumoniae* was less frequent (1%–2% each). No agent was identified in 60% to 70% of cases, although the patients often had a history of respiratory or gastrointestinal infection.[16]

Flaccid quadriparesis was the commonest clinical presentations. Cranial nerves involvement, paresthesia and life-threatening respiratory paralysis were also encountered in10% patients. Similar report were found in other studies .[17]Muscle atrophy was not apparent in our patients in the early course of the disease (within weeks) as observed in acute axonal forms ofGBS.[18]

In most of the patients weakness progressed for 3-5 days. This rapid and wide spread evolution was also described by many authors.

Albuminocytologic dissociation in CSF analysis was found in one third of cases. It highlights futility of CSF studies especially in the early course of the disease.[19]

Nerve conduction studies conductedearliest within the five days after the onset of symptoms confirmed all cases of GBS variants.AMSAN was the predominant type. AMAN, AIDPand MLFconstituted 28%, 10% and 4 %of our current study group respectively. AIDP is by far the most common form of GBS in Europe and North America, whereas AMAN occurs more frequently in East Asia (China and Japan).[20]

Among our study 23 patients received plasmapheresis and another 9 received standard IVIg therapy. These patients were followed up during their hospital stay and most up to 30 days by passive surveillance .Significant improvement occurred in 20 (88%) who received plasmapheresis and 7 (77.6%) who received IVIg .So, the patients treated with plasmapheresis, showed -statistically insignificant better outcomes than those treated with IVIg, similar to other studies[,21]

High-doseIVIg therapy and plasma exchange aided more rapid resolution of the disease when started in early course of disease. Thisobservation was also found in other studies.[8,21]

Neurodeficit persisted at the end of one monthin small group ofour patients who received only supportive treatment in the form of physiotherapy. However, these numbers are too small to reach any conclusion. In our country the major determinant of choice of therapy is cost and availability.

Conclusion

In conclusion, it can be said that in Bangladesh GBS affects population of similar demographic profile as observed worldwide. More generalized and rapid evolution of flaccid quadriparesis with cranial nerve involvement is noted in diabetic population.NCS conducted earliest within the five days after the onset of symptoms can confirm all cases of GBS variants.

AMSAN is the commonest variant. High-doseIVIgtherapy and plasma exchange aid more rapid resolution of the disease when started in early course of disease. Early and specific diagnosis is important to ensure a favorable outcome.

Limitations

This study had few limitations .Number of case was small and most patients were diabetic. GBS patients directly admitted into ICU care for respiratory assistance were not included in this study. All of patients were could not be brought to follow –up. Alarge, multi-center study including large number of patients will give better representative picture from tertiary care hospital of Bangladesh.

Conflict of interest: None

References

1. Yuki N, Hartung HP. Guillain-Barré syndrome. N Engl J Med 2012; 366:2294.
2. Alshekhlee A, Hussain Z, Sultan B, Katirji B. Guillain-Barré syndrome: incidence and mortality rates in US hospitals. Neurology 2008;70:1608.
3. Kieseier, B.C., Hartung, H.P., Wiendl, M., 2006a. Immune circuitry in the peripheral nervous system. Curr. Opin. Neurol.2006; 19: 437–45.
4. Govoni, V., Granieri, E. Epidemiology of the Guillain-Barrésyndrome. Curr. Opin. Neurol. 2001; 14: 605–613.
5. Cornblath DR, Mellits ED, Griffin JW, et al. Motor conduction studies in Guillain-Barré syndrome: description and prognostic value. Ann Neurol 1988; 23:354
6. Chiba, A., Kusonoki, S., Obata, FL, et al. "Serum anti-GQlbIgG antibody is associated with ophthalmoplegia in Miller Fisher syndrome and Guillain-Barre syndrome: clinical and immunohistochcmical studies," Neurology, 1993; 43: 1911-1917
7. Criteria for diagnosis of Guillain-Barré syndrome. Ann Neurol 1978; 3: 565.
8. Lehmann, H.C., Hartung, H.P., Hetzel, G.R., et al., Plasma exchange in neuroimmunological disorders: part 2. Treatment of neuromuscular disorders. Arch. Neurol.2006; 63: 1066–71.
9. Raphael, J.C., Chevret, S., Harboun, M., et al., Intravenous immune globulins in patients with Guillain-Barré syndrome and contraindications to plasma exchange: 3 days versus 6 days.J. Neurol. Neurosurg. Psychiatry 2001; 71: 235–38.
10. Plasma Exchange/Sandoglobulin Guillain-Barre Syndrome Trial Group. "Randomized trial of plasma exchange, intravenous immunoglobulin, and combined treatments in Guillain- Barre syndrome," Lancet, 1997; 349: 225-30
11. Hughes, R.A., Raphael, J.C., Swan, A.V., et al. Intravenous immunoglobulin for Guillain-Barré syndrome. Cochrane Database Syst. Rev. 2001; 2: CD002063.
12. Odaka, M., Yuki, N., Hirata, K. Patients with chronic inflammatory demyelinating polyneuropathy initially diagnosed as Guillain- Barré syndrome. J. Neurol. 2003; 250: 913–916
13. Rajabally YA, Uncini A. Outcome and its predictors in Guillain-Barre syndrome. J NeurolNeurosurg Psychiatry 2012;83:711
14. Sejvar JJ, Baughman AL, Wise M, Morgan OW. Population incidence of Guillain-Barré syndrome: a systematic review and meta-analysis. Neuroepidemiology 2011;36(2):123-33.
15. Islam Z, Jacobs BC, van Belkum A, Mohammad QD, Islam MB, Herbrink P, et al. Endemic axonal variant of Guillain-Barré syndrome frequently associated with *Campylobacter* infections in Bangladesh. Neurology 2010;74:581–87.
16. Jacobs BC, Rothbarth PH, van der Meche FG, Herbrink P, Schmitz PI, de Klerk MA, et al. The spectrum of antecedent infections in Guillain-Barré syndrome: a case-control study.Neurology 1998; 51:1110–15
17. Dhadke SV, Dhadke VN, Bangar SS, Korade MB. Clinical Profile of Guillain Barre Syndrome. J Asso Physicians India 2013;61:168-72
18. Feasby TE, Gilbert JJ, Brown WF, et al: An acute axonal form of Guillain-Barré polyneuropathy. Brain 109:1115
19. Cea G, Jara P, Quevedo F. Clinical features of Guillain-Barré syndrome in 41 patients admitted to a public hospital. Rev Med Chile 2015 ;143 (2):183-89 .
20. Kuwabara S. Guillain-Barré syndrome: epidemiology, pathophysiology and management. Drugs 2004; 64(6): 597-610.
21. Hadden RD, Cornblath DR, Hughes RC, Zielasek J, Hartung HP, Toyka KV, et al. Electrophysiological classification of Guillain–Barré syndrome: clinical associations and outcome. Ann Neurol 1998; 44: 780–88.