Original Research Article

Clinical outcome of Gullian-Barre Syndrome in a tertiary care teaching hospital – A prospective observational study

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Abstract

Background: Gullian-Barre Syndrome (GBS) is an acute inflammatory demyelinating polyneuropathy (AIDP) with autoimmune background. The clinical management of GBS is by nerve conduction velocity (NCV) and supportive care, intravenous immunoglobulin's (IVIG) and Plasmapheresis. We have studied the clinical outcome of Gullian-Barre Syndrome patients visiting to the tertiary care hospital in Andhra Pradesh.

Material and methods: A cross sectional study was conducted in a tertiary care teaching hospital at Andhra Pradesh in 50 patients over the period of 2 years. Neurological examination like higher mental functions, cranial nerves, motor system, sensory system and autonomic system was done for all patients. Descriptive analysis of clinical presentation, type of GBS, occurrence of complications and final outcome was also done.

Results: A total of 50 participants were included in the study. Majority (52%) of the study participants were aged below 40 years. Diabetes mellitus (DM) and hypertension (HTN) were the

most common co-existing illnesses reported in 8% and 6% of study population respectively.
Conclusion: The majority of the Guillain-Barre Syndrome patients recovered smoothly without going for complications. Prognostic outcome was poor in our study with increasing age and co-existing illness like diabetes mellitus or ischemic heart disease.

Key words

Guillain-Barre Syndrome (GBS), Acute Inflammatory Demyelinating Polyneuropathy (AIDP), Nerve conduction velocity (NCV), Intravenous immunoglobulin (IVIG).

Introduction

Gullian-Barre Syndrome (GBS) is an acute inflammatory demyelinating polyneuropathy (AIDP) with autoimmune background and also known as Landry's Paralysis [1, 2]. GBS manifests as rapidly evolving areflexic motor paralysis with or without sensory disturbance. The usual manifestations are loss of vasomotor control with wide fluctuation in blood pressure, postural hypotension and cardiac arrhythmias. Respiratory failure occurred and ventilator assistance was required in 30% cases [3]. The theories suggest an autoimmune mechanism in which the patient's defense system of antibodies and WBC are triggered into damaging the nerve coverings or insulation leading to weakness and abnormal sensation [4]. The clinical management of GBS was by nerve conduction velocity (NCV) and supportive care, intravenous immunoglobulins (IVIG) and Plasmapheresis [1, 3]. To this purpose we have studied the clinical outcome of Gullian-Barre Syndrome patients visiting to the tertiary care hospital in Andhra Pradesh.

Material and methods

Study design: The study was a cross sectional study conducted in a tertiary care teaching g hospital.

Study setting: Outpatient and inpatient sections of Department of Internal medicine and neurology, NRI Medical College, Chinakakani, Guntur District, Andhra Pradesh.

Study duration: The data collection for the study was conducted for a two year period during October 2012–September 2014.

Study population: Any patient presenting to the study setting, with symptoms suggestive of Guillain-Barre Syndrome.

Sample size: A total of 50 subjects were included in the study.

Sampling method: All the subjects, who satisfied the inclusion and exclusion criteria were included in the study, hence no sampling was done.

Inclusion criteria

- Any patient admitted with features suggestive of flaccid progressive weakness affecting all the four limbs was included.
- Any patient admitted with progression of weakness of less than 4 weeks duration was included.
- Any patient admitted with reduced or absent deep tendon reflexes were included

Exclusion criteria

- Any patient admitted with features of hypokalemic periodic paralysis.
- Any patient admitted with features of upper motor neuron signs and symptoms.
- Any patient admitted with severe protopathic sensory symptoms.
- Any patient admitted with history of bite preceding the illness.
- Any patient admitted with history of exposure to toxins like organophosphates.
- Any patient with severe terminal illness.
- Patients admitted with history of suspected food poisoning.
- Patients in whom the weakness progressed for more than 4 weeks.

Study procedure: The initial assessment was based on clinical history, detailed neurological examination, routine investigations and special investigations like cerebrospinal fluid analysis and electro diagnostic studies. Detailed neurological examination including higher mental functions, cranial nerves, motor system, sensory system and autonomic system was done for all patients. Motor power in these patients was assessed according to Medical Research Council grading. Autonomic dysfunction was looked for in all these patients. History of dryness of mouth, postural giddiness and defective sweating over the body were specifically asked for.

Blood pressure was routinely taken in lying and sitting posture and if possible in standing posture to bring out orthostatic hypotension. Sympathetic skin response was not done due to technical problem. Respiratory function tests were done in all patients, everyday during hospitalization, including breath-holding time, single breath count, blowing candle at one arm length, chest expansion, Litten's phenomenon.

Likewise, basic investigations like complete blood count, peripheral smear, blood sugar and urea, serum creatinine and electrolytes, erythrocyte sedimentation rate, daily electrocardiogram, chest x-ray were done for all the patients. Lumbar puncture was done for 42 patients and Cerebro Spinal Fluid was sent for Gram's stain, biochemical and cytological analysis. Electrophysiological studies were conducted by using the machine RMS advance Testing lab. Nerve conduction studies were done in both upper and lower limbs. In upper limbs, proximal latency, distal latency, motor nerve conduction velocity, F-response were studied in ulnar, median and radial nerves. In lower limbs, similarly proximal latency, distal latency, motor nerve conduction velocity, F-response, H -reflex were studied in sciatic, lateral popliteal and posterior tibial nerves. Sensory conduction velocities were studied in median nerve, ulnar nerve and sural nerve. Electromyography was done with surface electrodes in thenar and hypothenar muscles, quadriceps, calf muscles, extensor digitorum. Insertional activity was recorded. Resting activity was recorded. Fibrillation potential, fasciculation potential, positive sharp waves were looked for. Recruitment and interference pattern were looked for. Compound muscle action potential was recorded. Magnetic Resonance Imaging was done in 4 patients who presented with altered sensorium, sensory disturbance and urinary retention. Other investigations like CSF analysis, Nerve conduction studies and MRI were done as per individual case requirements.

Ethical considerations: Ethical approval of human ethics committee of the study setting was obtained. Informed written consent was obtained from all the participants, after explaining voluntary nature of the study, risks and benefits involved. Confidentiality of the participants was maintained throughout the study.

Statistical analysis

The socio demographic parameters, details of previous medical illness and antecedent events were presented. Descriptive analysis of clinical presentation, type of GBS, occurrence of complications and final outcome was also done. All the variables were presented as frequencies and percentages. IBM SPSS version 21 was used for statistical analysis.

Results

A total of 50 participants were included in the study. Males and females constituted 30 (60%) and 20 (40%) participants respectively. Majority (52%) of the study participants were aged below 40 years. only 9 (18%) of patients were above 60 years and the remaining 30% of the subjects were between 41 to 60 years (**Table - 1**).

Diabetes mellitus and Hypertension were the most common co-existing illnesses reported in 8% and 6% of study population respectively. Coronary artery disease and pulmonary tuberculosis was reported in 2 (4%) subjects each. Respiratory illness and gastro intestinal

disease were the most common antecedent events reported in study population, reported in 7 (14%) and 5 (10%) of the subjects each. The other antecedent events reported were vaccination, Hodgkin's lymphoma and HIV in 1 (2%) subject each (**Table - 2**).

Table - 1: Socio demographic characteristics of study population.

Parameter	Frequency	Percentage
Gender		
Male	30	60%
Female	20	40%
Age groups (Years)		
Less than 40	26	52%
41 – 60	15	30%
61 and above	9	18%

Table - 2: Coexisting medical illness and antecedent events in study population.

Parameter	Frequency	%
Illness		
Diabetes Mellitus	4	8%
Hypertension	3	6%
CAD	2	4%
Pulmonary Tuberculosis	2	4%
Antecedent events		
Respiratory illness	7	14%
Gastrointestinal illness	5	10%
Vaccination	1	2%
Hodgkin's lymphoma	1	2%
HIV	1	2%

Weakness of upper and lower limbs was the most common presentation seen in 42 (84%) of study subjects. followed by autonomic dysfunction (40%). Fifteen (30%) subjects each had respiratory muscle, neck muscle weakness and sensory disturbance. Bulbar weakness and bilateral facial muscle weakness was seen in 8 (16%) and 7 (14%) of the subjects respectively. four (8%) of the subjects had altered sensorium. Only 2 (4%) subjects had ocular muscle involvement and ataxia was seen only in 1 participant (**Table - 3**).

Table - 3: Analysis of the clinical presentation in study participants.

Parameter	Frequency	%
Weakness of both upper and lower limbs	42	84%
Autonomic dysfunction	20	40%
Respiratory muscle weakness	15	30%
Neck muscle weakness	15	30%
Sensory disturbance	15	30%
Bulbar weakness	8	16%
Bilateral facial weakness	7	14%
Altered sensorium	4	8%
Ocular muscle involvement	2	4%
Ataxia	1	2%

The most common types of GBS seen in study participants was AIDP, seen in 25 (50%) and Acute Motor Axonal Neuropathy (AMNAN), seen in 12 (24%) participants. Acute Motor and Sensory Axonal Neuropathy (AMSAN), sensory GBS and MFS types were seen in 10 (20%), 2 (4%) and 1 (2%) of the participants respectively (**Table - 4**).

Table - 4: Type of Gullian-barre syndrome in study participants.

Type	Frequency	Percentage
AIDP	25	50%
AMAN	12	24%
AMSAN	10	20%
SENSORY GBS	2	4%
MFS	1	2%

Autonomic disturbance was the most common complication reported in the study population, seen in 20 (40%) of the subjects. respiratory failure was seen in 15 (30%) subjects and 7 (14%) subjects had ventricular arrhythmias. Majority (80%) of the subjects recovered spontaneously without any squeal. Residual paralysis was present in 5 (10%) subjects and 5 (10%) subjects met with morality (**Table - 5**).

Table - 5: Complications and clinical outcome in study participants.

Outcome	Frequency	%
Complications		
Autonomic disturbance	20	40%
Respiratory failure	15	30%
Ventricular arrhythmias	7	14%
Final outcome		
Spontaneous recovery	40	80%
Mortality	5	10%
Residual paralysis	5	10%

Discussion

Acute Inflammatory Demyelinating Polyneuropathy (AIDP) is the most known form of acute neuromuscular disorder encountered in clinical practice. In our study, 50 cases were studied in a span of 2 years hence it is insufficient to predict incidence of GBS from it in this area. Guo-Xin J, et al. [5] in their study in Sweden has observed two peaks one between 20 to 24 years and the other between 70-75 years. But, in our study 26 (52 %) of patients were below 40 years. NK Singh, et al. [6] also found that age did not affect outcome. In our study, we found older the age as a poor prognostic factor. Approximately one third of patients reported a history of an antecedent event. Winter, et al. [7] reported that over half of GBS patients experience symptoms of viral respiratory or gastrointestinal infections. Study by NK Singh, et al. [6] showed that presence of bulbar paralysis is also associated with a poor prognosis and insisted the need for assisted ventilation. Our study also had poor prognosis with bulbar weakness. But very interestingly, in our study also showed patients on mechanical ventilator has poor prognosis. Cerebrospinal fluid analysis in patients with Guillain-Barré Syndrome who had increased protein correlated with severe demyelination in electrodiagnostic studies showed delayed recovery. Our results were closely associated with the Sreenivasa Rao Sudulagunta, et al. [8].

Conclusion

The majority of the Guillain-Barre Syndrome patients recovered smoothly without going for complications. One third of the patients developed respiratory muscle weakness and autonomic disturbance of varying severity. Prognostic outcome was poor in our study with increasing age and co-existing illness like diabetes mellitus or ischemic heart disease.

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