Guillain-barre Syndrome in Indian Population: A Retrospective Study

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Abstract

Objectives: To study clinical characteristics of various forms of Guillain-Barre syndrome in Indian adults.

Material and Methods: The epidemiological, clinical, cerebrospinal fluid and electrophysiological data of 65 patients of Guillain-Barre syndrome (GBS) were reviewed in a retrospective study.

Results: Analysis of age distribution disclosed a high incidence (36.92%) in young adults between 18 to 29 years of age. Seasonal preponderance in winter and summer was found. Preceding events were identified in 22 (33.84%) cases. Motor weakness, areflexia, and facial weakness were the most common clinical features. Cerebrospinal fluid albuminocytological dissociation was present in 80% of patients. Utilising clinical and electrophysiological data, these 65 patients with Guillain-Barre syndrome were subclassified as acute demyelinating polyradiculoneuropathy 17 (26.15%), axonal form 17 (26.15%), Fisher' s syndrome 2 (3.07%)and ataxic variant 1(1.53). The remaining 28 (43.07%) patients were unclassified. 9(13.8%) patients had recurrent GBS. Only 5 (7.7%) patients required mechanical ventilation. Follow up available on 47 patients disclosed that all of them recovered satisfactorily. No patient was persistently disabled and no mortality occurred during hospitalization.

Conclusions: GBS in Indian population from northwest India showed peculiar age, seasonal distribution and high frequency of both AIDP and axonal subtypes. Both, axonal and demyelinating subtypes shared common clinical features and had good prognosis.

Introduction

Guillain-Barre syndrome (GBS) is an acute, monophasic, symmetrically progressive, ascending demyelinating polyneuropathy characterized by rapidly evolving symmetrical limb weakness, areflexia, absent or mild sensory signs, and variable autonomic disturbances. It is the major cause of acute neuromuscular paralysis, with an annual incidence of 1.3-2 per 100,000 worldwide.[1]

GBS can be subgrouped into acute inflammatory demyelinating neuropathy (AIDP), Fisher syndrome (FS) and axonal forms (acute motor axonal neuropathy [AMAN], acute sensorimotor axonal neuropathy [AMSAN]).[2]

The purpose of this study was to review cases of GBS to study their epidemiological, clinical, cerebrospinal fluid and electrophysiological profile.

Materials and Methods

We reviewed the medical records of all adult GBS patients admitted to Neurology Department, SMS Medical College Hospital Jaipur, India, a teaching hospital located in northwest India and also a tertiary referring medical centre for the region, from January 2013 to May 2015. Asbury and Cornblath's clinical diagnostic criteria for GBS were used for clinical diagnosis.[3] We recorded data on age, sex, preceding events, date of onset of disease, clinical manifestations including initial symptoms, and neurological findings, results of cerebrospinal fluid (CSF) study, and specific treatments including steroids(methyl prednisolone), plasmapheresis, and intravenous immunoglobulin (IVIg). We also registered the findings of electrophysiological studies, including distal motor, sensory and F wave latencies, amplitudes of compound muscle action potentials (CMAPs) and sensory nerve action potentials (SNAPs), and motor and sensory conduction velocities.

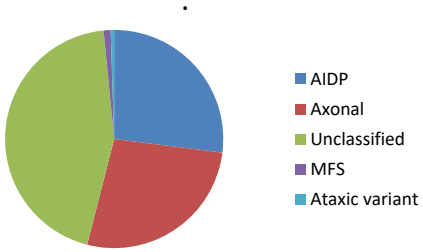

Fig. 1: Pie chart showing percentage of various subgroups of GBS

At the time of their maximal deficit during admission to the hospital, patients were graded using a disability scale (Hughes et al).[4]

Based on initial electrophysiological findings, patients were classified as having AIDP according to Albers and Kelly 1989 criteria[5] and having axonal forms of GBS (AMAN or AMSAN) if there was no electrophysiological evidence of demyelination as defined above, together with a decrease of CMAP or SNAP amplitudes to less than 80% of lower limit of normal in at least two tested nerves.[6] Patients were considered unclassified if data did not confirm to either category. A diagnosis of Fisher syndrome (FS) was made in patients who presented with triad of ataxia, areflexia, and ophthalmoplegia.

Results

During the study period, 65 patients who fulfilled the diagnostic criteria for GBS were identified. According to the clinical and electrophysiological findings, 17 (26.15%) patients had AIDP, 17 (26.15%) had axonal forms of GBS (11 AMAN, 6 AMSAN), 2(3.07%) had FS, 1(1.53%) had ataxic variant, however 28(43.07%) patients remained unclassified in our study (Figure 1).

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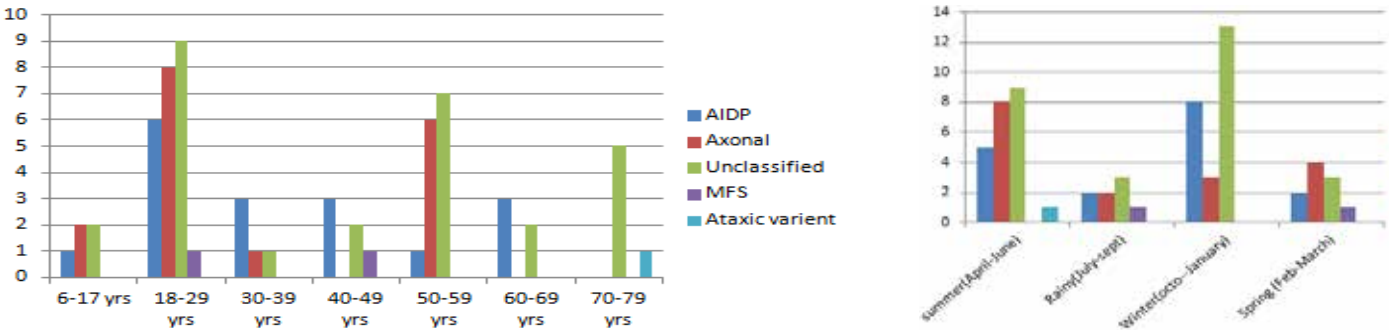

Fig. 2: Age and seasonal distribution of Guillain-barre syndrome

Table 1: Demographic features, preceding events and Clinical features in patients with various forms of GBS

	AIDP (n=17)	Ataxic variant (n=1)	FS (n=2)	Axonal (n=17)	Unclassified (n=28)
Mean age (yr)	37.23	70	33	33.29	43.67
Sex (male / female)	13/ 4	0/1	2 / 0	12 / 5	20 / 8
			Preceding events		
URTI	2				1
Febrile illness	2	1	1		8
Acute gastroenteritis	1			3	1
Jaundice	1				
Chiken pox	1				

AIDP= acute inflammatory demyelinating polyradiculopathy, FS=fisher variant, n= numbers of patients, DTR= Deep tendon reflex, URTI =upper respiratory tract infection.

Table 2: Clinical features in patients with various forms of GBS

Clinical features	Total (n=65)	AIDP (n=17)	Ataxic variant (n=1)	FS (n=2)	Axonal (n=17)	Unclassified (n=28)
Limb weakness	62	17	0	0	17	28
Reduced or absent DTRs	60	16	1	1	15	28
Facial weakness	14	5	0	0	4	5
Sensory signs	18	4	1	1	3	11
Bulbar weakness	8	1	0	1	2	4
Respiratory failure	8	2	0	0	3	3
External ophthalmoplegia	4	0	0	1	0	2
Ptosis	2	0	0	1	0	1
Ataxia	2	0	1	1	0	0

AIDP= acute inflammatory demyelinating polyradiculopathy, FS=Fisher variant, n= numbers of patients, DTR= Deep tendon reflex.

Age, Sex and Seasonal Distributions

The age of all 65 patients ranged from 6 to 75 years (mean 37.9 years) with the highest frequency (40%) in adults between the ages of 18 to 29 years (Figure 2). A total of 47 (72.3%) were male and 18(27.69%) were female (Table 1). Seasonal preponderance was found in cases of GBS, overall 24 (36.9%) of all patients were admitted in winter (October-January) and 23 (35.38%) of all cases were admitted in summer (April-June) (Figure 2) while 18 (27.69%)patients were admitted in other season.

Preceding Events

Various preceding events before onset of illness were noted in 22 (33.84%) patients. The interval between the onset of preceding events and the onset of symptoms ranged from 11 days to 45 days. All events were infectious diseases (Table 1), mostly nonspecific febrile illness (12 patients), acute gastroenteritis in (5 patients) and upper respiratory tract infection (3patients). Identifiable viral infections included chicken pox in 1 patient and acute viral hepatitis A in 1 patient.

Clinical Features

The most frequent initial symptoms in overall GBS patients were limb weakness in 62 (95.38%), sensory symptoms in form of paresthesias, muscle pain and back pain in 20 (30.7%) patients, facial weakness in 14 (21.53%), and bulbar dysfunction in 8 (12.30%).

Table 2 summarises the clinical features during the course of disease.. Limb weakness was a universal feature in all GBS patients except two FS patient. Reduced or absent reflexes either generalised or limited to lower extremities were found in all but 3 patients. Bilateral 7th nerve weakness, symmetrical or asymmetrical was the commonest cranial nerve dysfunction, followed by 9th, 10th and 3rd, 4th, 6th respectively. Respiratory failure was present in 8 (12.3%) patients during the course of illness and shifted to ICU but only 5 patients were on ventilator and 3 patients managed without ventilator.

At the time of their maximal deficits, 25 (38.46%) patients reached the grade 2, 15 (23.07%) grade 3, 19 (29.23%) grade 4 and 4 (6.10%) grade 5.

Cerebrospinal Fluid Studies

Lumbar puncture was performed in 39 patients. The CSF protein concentration was raised (≥ 45 mg/dl) in 33 (84.61%) cases. The frequency of raised CSF protein concentration was 76.9% in first week, 85.7% in second week and 100% beyond second week. The CSF cell count was normal (< 10 cells/mm^3) in all 39 (100%) patients. In total, 39 (84.61%) patients showed albuminocytological dissociation on CSF examination. One patient had cell count 103 on 4th day of IVIg therapy(aseptic meningitis).

Data for CSF were available in 10 with axonal forms, 9 patients with AIDP, 2 with FS, 1 with ataxic variant, and 17 with unclassified group. In these subgroups raised protein concentration was found in 6 (60%), 8 (88.88%), 2 (100%), 1(100%)and 16 (94.11%) respectively.

CSF proteins were raised in 2 out of 2(100%) patients with grade 1 disability score, 12 (60%) patients out of 17 with grade 2 disability score and 19(95%) patients out of 20 with grade ≥3 disability score.

Specific Treatments, Outcomes and Prognostic Factors

The average duration of admission to hospital for all patients was 12.05 days (range 3 to 90 days). In addition to general medical management,

43(66.15%) patients received specific treatments: 25 (38.46%) IVIg alone, 16 (24.61%) steroids alone, and in 2 (3.07%) patient plasmapheresis was done. All 65 patients discharged from hospital after improvement of at least one grade from their maximal deficit. No patient died during hospitalization. 5 (7.6%) patients required mechanical ventilation. Mean duration of stay in hospital in these five patients was 48.6 days (range 19 to 90 days). Follow up at 3 months to 1 year was possible in 47 patients. A good outcome with normal functional life was noted in all patients.

Recurrent Guillain-barre Syndrome

9 (13.84%) patients out of total 65 cases had history of similar illness in past. Male to female ratio was 8:1 and their age ranged from 23 to 57 years. Interval between present and past episode was >5 years in all patients. Preceding event in the form of nonspecific febrile illness was present in 4 out of 9 patients with recurrent GBS. Among the subgroups 3 out of 9 were unclassified, 3 had axonal forms,1 patient had ataxic variant and 1 patient had recurrent FS. All 6 patients from unclassified and axonal subgroups had symmetrical motor weakness of extremities, generalized areflexia and 2 patients had bulbar and respiratory involvement. Lumbar puncture was performed in 6 patients out of whom 5 showed albuminocytological dissociation. One patient required mechanical ventilation.

GBS Variants

Recognized variants like AMAN (11 patients), AMSAN (6 patients), and MFS (2 patient) were observed in our patients. Apart from this, only lower limb weakness (paraparesis) was present in 8 patients (3 from AIDP subgroup, 1 from axonal subgroup and 4 from unclassified subgroup). Out of all 65 patients, 3 patients had preserved deep tendon reflexes.

Of special note are 2 patients; first was a 25 years old student who developed asymmetric proximal weakness of both upper limbs (bibrachial) preceded by jaundice 8 days prior to onset of weakness. He had positive titre for anti hepatitis A antibody, normal CSF protein and demyelinating polyneuropathy in electrophysiological studies.

Second patient was a 49 year old female who presented with 4 days history of progressive ascending symmetrical quadriparesis preceded by febrile illness 1 week prior to onset of weakness. Additional features on examination were bilateral external ophthalmoplegia, ptosis, facial weakness, bulbar weakness and generalized areflexia. Her MRI brain was normal, CSF showed albuminocytological dissociation and electrophysiological studies revealed nonrecordable SNAPs and normal motor conduction. She responded promptly to IVIg.

Discussion

The classical presentation, progressive areflexic motor weakness and albuminocytological dissociation are the most reliable criteria for the diagnosis of GBS.[7,8] Electrophysiological studies have a crucial role in confirming the diagnosis and distinguishing various subtypes. Most of the electrophysiological criteria are from western studies where AIDP is more prevalent and hence, most criteria addressed the diagnosis of AIDP. There is paucity of data from the Indian subcontinent and the available data suggests AIDP as the most common subtype.[9,10] There has been considerable variation in the yield of AIDP when different sets of criteria were applied to patients. Alam et al found 21%to 72% patients belonging to AIDP variant applying six available criteria sets.[11] Alexender et al identified 23% to 67% having AIDP using six different criteria.[12] Furthermore, importance of serial electrophysiological studies for better characterization of GBS subgroups has been highlighted in previous studies.[13] In our study 28 (43.07%) patients were categorized in unclassified group. This high percentage of unclassified patients probably reflects the low yield of Albers and Kelly 1989 criteria for AIDP, early timing and single electrophysiological study in our patients, and presence of variant GBS patients.

Of 65 patients with clinically defined GBS, only 2 (3.07%) had FS. This low frequency of FS is similar to its low frequency of 2% to 7% in series from western world.[14] Axonal forms of GBS, including AMAN and AMSAN occurred in 30.7% of our patients. In North America and Europe, around 5% of patients with GBS have the axonal subtypes, whereas in Central and South America, Japan and China axonal subtypes account for 30-47% of cases.[15] Increases in rates were observed in most studies of people aged 50 years or more.[15] In our series GBS patients showed a pattern with maximum number of patients in 18-29 years age group(figure 2).

The issue of seasonal variation in incidence was raised in some studies. Some found more cases in colder months although cluster of cases were reported in spring and summer in Brazil, during winter and June in Netherlands and during autumn in Sweden. In studies from northern China, a striking seasonal preponderance was found in summer months.[15] In our series, there was a seasonal clustering in winter (October-January) and summer (April-June).

Preceding events were detectable in 33.84% of our patients. In most series reporting this information, 40-70% of cases recorded an infection prior to onset. In our study nonspecific febrile illness was the most common preceding event in 12 (54%)patients, followed by acute gastrointestinal illness, which occurred in 5 (22.72%) patients and URI in 3(13.6%) patients (Table 1).

Recurrent GBS was present in 9 (13.84%) patients in our study. The epidemiological, clinical, cerebrospinal fluid and electrophysiological characteristics of these patients were similar to those with monophasic illness.

Common variants of GBS in form of AMAN, AMSAN, ataxic variant and MFS all were present in our study. Apart from these, variants with regional affection in form of paraparesis were found in 8 (12.30%) patients and asymmetrical bibrachial weakness was present in 1 patient who was recovering from acute viral hepatitis (hepatitis A virus). Association of GBS and hepatitis A infection has been reported earlier in few case reports.[17]

One patient of "overlapping GBS" had features of oculofaciobulbar weakness and flaccid quadriparesis. Overlapping GBS with similar features have been previously described in literature in relation to Bickerstaff`s brainstem encephalitis.[16]

Follow up studies showed that most of our patients recovered without appreciable neurological squelae and resumed a normal life. There was

no mortality in our series. Indefinite confinement to bed or wheelchair or prolonged mechanical ventilator dependence was not found in our patients. These results indicate that GBS in Indian adults is a disease with good prognosis in patients who survive acute stages. In addition, considerable clinical improvement shortly after initiation of specific therapies was found in most of our patients.

To conclude, GBS in Indian population from northwest India showed peculiar age and seasonal distribution and high frequency of both AIDP and axonal subtypes. Both axonal and demyelinating subtypes shared common clinical features and had good prognosis. Therefore treating clinicians should remain cautious but need not be unnecessarily over apprehensive while dealing with GBS.

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