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ORIGINAL ARTICLES

Clinical, Autonomic & Electrophysiological Features in Patients with Guillain Barre Syndrome in a Tertiary Care Hospital of Bangladesh

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Abstract:

Background: *Guillain-Barre Syndrome (GBS) is the most common cause of acute flaccid paralysis in the adult population. It is an acute post infectious immune mediated peripheral neuropathy with a marked variation in pathology, clinical presentation and prognosis.*

Objective: *The aim of the study were to evaluate clinical profile, to assess autonomic involvement & electrophysiological findings in adult patients with GBS.*

Methods: *An observational, cross sectional study was carried out in the Department of Neurology, BSMMU, Dhaka from March, 2015 to September, 2017. Total 43 patients of GBS fulfilling the inclusion criteria were recruited as the study population. Detailed clinical examination, CSF study & nerve conduction study were done. Disability status was measured by Hughes functional grading scale. For autonomic assessment 35 adult healthy control were also included for comparison. Then following tests of autonomic nervous system were performed in both patient and control group 1) resting heart rate and heart rate on changing posture (30: 15 ratio) 2) supine blood pressure and blood pressure on changing posture 3) heart rate response to valsalva maneuver 4) heart rate response to deep breathing and E: I ratio 5) sphincter disturbance by symptoms questionnaire.*

Results*: The mean age of patients was 35±12 years (range18 to 65 years) with slight male predominance (58.1%). Major clinical presentation was weakness of all 4 limbs followed by sensory complaints (44.2%). 7% of the patient had breathing difficulty and dysphagia. Only 4.7 % had diplopia. Among the symptoms of autonomic dysfunction most common symptoms was constipation (30.2 %) followed by palpitation (14%), urinary retention (7%), lightheadedness and urinary incontinence (4.7%). Cranial nerve palsy was present in 34.9% of cases among them facial palsy was found commonly (27.9%), followed by bulbar palsy (7%) and ophthalmoplegia (4.7%). One patient (2.3%) had both facial palsy and ophthalmoplegia. AIDP, AMAN and AMSAN subtypes comprised 32.6%, 37.2% and 20.9% of cases respectively. Regarding autonomic dysfunction variation of heart rate by different maneuver like posture change, deep breathing and valsalva maneuver was found commonly. 30:15 ratio was abnormal in majority of the*

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patients (82.4%) followed by abnormal max-min HR/min on deep breathing (58.1%) and abnormal valsalva ratio (37.2%). Other abnormalities were postural hypotension (38.2%), sinus tachycardia (25.6%), hypertension (16.3%), hypotension (4.7%), and sinus arrhythmia (4.7%). Bowel bladder dysfunction was another autonomic dysfunction among them constipation 30%, urinary retention 7% and urinary incontinence 4.7% of cases.

***Conclusion:** GBS can be presented with variable presentation including autonomic dysfunction. In this study common clinical presentation was limb weakness & different patterns of autonomic dysfunction was found in patients with GBS. Common electrophysiological subtype was AMAN. So in addition to clinical & electrophysiological analysis autonomic evaluation is essential in every patients with GBS as autonomic dysfunction is one of important cause of mortality.*

***Key words:** Guillain Barre Syndrome (GBS), autonomic dysfunction, AIDP, AMAN, AMSAN, Hughes functional grading.*

Introduction:

Guillain-Barre syndrome (GBS) is an acute onset, immune-mediated disorder of the peripheral nervous system. The classic forms of GBS affects persons of all ages, but men are about 1.5 times more likely to be affected than women[1]. The mean annual incidence is1.1 to 1.8 per 100000 population[2].

A mild respiratory or gastrointestinal infection or immunization precedes the neuropathic symptoms by 1 to 3 weeks in approximately 60% of the patients[3]. The most common antecedent infection recognized before the onset of GBS is Campylobacter jejuni enteritis[4].

GBS is clinically characterized by acute flaccid paralysis, areflexia, mild sensory disturbance and albumino- cytological dissociation in the CSF. Rapidly progressive weakness is the core clinical feature of GBS. Maximum weakness is reached within 4 weeks, but most patients have already reached their maximum weakness within 2 weeks[5]. Besides motor and sensory deficits, GBS is often associated with a variety of autonomic involvement including cardiovascular, vasomotor, or sudomotor dysfunctions in both the sympathetic and parasympathetic systems.

Autonomic dysfunction of various degree has been reported in 65% of patients admitted to the hospital[6]. Most of the clinically significant autonomic dysfunction occurs with in the first 2-4 weeks of the illness, the peak period of paralysis. It's varied and complex manifestations may be related to either increased or decreased sympathetic – parasympathetic activity resulting in orthostatic hypotension, episodic or sustained hypertension, sinus tachycardia, tachyarrhythmia etc. Potentially serious bradyarrhythmias ranging from bradycardia to asystole were found in 7 to 34 % of patients[7]. Excessive vagal activity accounts for sudden episodes of bradycardia, heart block and asystole. Serious cardiac arrhythmia with haemodynamic instability tend to be more frequent in patients with severe quadriparesis and respiratory failure. Cardiovascular disturbances were found to be a common feature of patients with GBS who were severely paralyzed, requiring assisted ventilation[8]. Severe autonomic dysfunction is an indication for ICU admission[9]. Acute autonomic dysfunction develops in the majority of patients with GBS and is a significant cause of death in these patients[10].

Electrophysiologically GBS is categorized into demyelinating (acute inflammatory demyelinating polyneuropathy-AIDP) and axonal (Acute motor axonal neuropathy-AMAN and Acute motor sensory axonal neuropathy-AMSAN) varieties[1]. These varieties are difficult to distinguish on clinical grounds alone and electrophysiology plays a determinant role in GBS diagnosis, classification of the subtypes and in establishing the prognosis[11].The frequency of AIDP and AMAN in the whole GBS population varies substantially between the countries. AMAN variety of GBS is more prevalent in the northern China, central and South East Asia and South America; whereas AIDP is more frequent in the Europe and North America[12]. Axonal variant of GBS is more frequent

in Bangladesh, associated with preceding Campylobacter jejuni infection[13].

Methods:

This Cross sectional observational study was conducted in the department of Neurology BSMMU, Dhaka from March, 2015 to September, 2017. Total 43 patients of GBS fulfilling the inclusion criteria were recruited as the study population. Detailed clinical examination, CSF study & nerve conduction study were done. Disability status at the time of autonomic testing was measured by Hughes functional grading scale. For autonomic assessment 35 adult healthy control were also included for comparison. Then following tests of autonomic nervous system were performed in both patient and control group 1) resting heart rate and heart rate on changing posture (30: 15 ratio) 2) supine blood pressure and blood pressure on changing posture 3) heart rate response to valsalva maneuver 4) heart rate response to deep breathing and E: I ratio 5) sphincter disturbance by symptoms questionnaire.

Statistical analysis

The medical records demographic, clinical, laboratory, NCS report and autonomic profile of the patients and control were recorded in the preformed data sheet. At the end of data collection, all the data were rechecked, coded and entered in standard statistical software used in BSMMU, data base using SPSS software (Version-24). Demographic variables were analyzed by Chi square test. Qualitative data were expressed as frequency and percentage. Quantitative data were expressed as mean ±SD.

Results and observations:

In this study the mean age (±SD) was 35 (±12) years (Table I). Higher frequency of GBS was found in male (58.1%) than female (Table 2). Most common presentation was weakness of all four limbs (100%) with lower limb weakness more than upper limb weakness. Sensory complaints were present in 44.2% of patients (Table 3). Common cranial nerve palsy was lower motor type facial palsy (27.9%). Bulbar palsy was present in 7% and ophthalmoplegia in 4.7% of cases. Among them one patient (2.3%) had both facial palsy and ophthalmoplegia. Symptoms of autonomic dysfunction was present in 39.5 % of cases among them constipation 30.2%, palpitation 14%, lightheadedness & dizziness 4.7%, urinary retention 7% and urinary incontinence 4.7% of cases (Table 4). Total cranial nerve palsy was present in 34.9% of cases. Disability status of majority of the patient (35%) was grade 4 severity according to Hughes functional grading scale. Nerve conduction studies showed majority of the patients (37.2%) having acute motor axonal neuropathy (AMAN) variety followed by acute demyelinating polyradiculoneuropathy (AIDP) & acute motor sensory polyradiculoneuropathy (AMSAN) in 32.6 & 20.9% of cases respectively. About 9.3% of cases could not be categorized into specific groups (Figure: 1). 27.9% of patients were treated with plasma exchange during their course of illness and 2.3 % of patient received intravenous immunoglobulin. Majority of the patients (69.8%) received no definite treatment (Table: 5). Among autonomic dysfunction variation of heart rate on different maneuver like changing posture (30:15 ratio 82.4%), deep breathing (58.1%) and valsalva maneuver (37.2%) were found commonly. Other autonomic dysfunction were postural hypotension 38.2 %, Sinus tachycardia 25.6%, hypertension 16.3%, hypotension and sinus arrhythmia 4.7% of cases (Table 6).

Table-I

Distribution of study population by age groups (n=43)

Age range	Number	Percentage
18 to 25 Yrs	13	30.2%
26 to 35 Yrs	12	27.9%
36 to 45 Yrs	11	25.6%
46 to 55 Yrs	4	9.3%
56 to 65 Yrs	3	7%
Total	43	100%
Mean (±SD)	35 (±12)	

Table-II

Gender distribution of patients (n=43)

Gender	Patient (n=43)	Percentage
Male	25	58.1%
Female	18	41.9%
Total	43	100%

Table-III

Presenting complaints of the patients (n=43)

	Frequency	Percentage
Weakness- lower limbs>upper limbs	43	100
Sensory complaints	19	44.2
Breathing difficulty	3	7
Dysphagia	3	7
Diplopia	2	4.7

Table-IV

Symptoms of autonomic dysfunction

Symptoms	Frequency (n=43)	Percentage
Constipation	13	30.2
Palpitation	6	14
Lightheadedness/ dizziness	2	4.7
Urinary retention	3	7
Urinary incontinence	2	4.7
Total		39.5

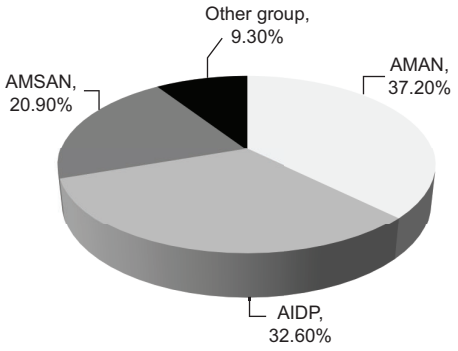

Fig.-1: *Distribution of patients according to electrophysiological features (n=43)*

Table-V

Patients receiving definite treatment (n=43)

Treatment modality	N (%)
Plasma Exchange	12 (27.9%)
I/V Immunoglobulin	1 (2.3%)
No definite treatment	30 (69.8%)
Total	43 (100%)

Table-VI

Frequency and pattern of autonomic dysfunction among patients with GBS (n=43)

Autonomic dysfunction	Frequency	Percentage
Tachycardia	11	(25.6)
Sinus Arrhythmia	2	(4.7)
Hypertension	7	(16.3)
Hypotension	2	(4.7)
Postural Hypotension	13	(38.2)
Abnormal 30:15 ratio	28	(82.4)
Abnormal Max-Min HR on deep breathing	25	(58.1)
Abnormal Valsalva ratio	16	(37.2)
Constipation	13	(30)
Urinary retention	3	(7)
Urinary incontinence	2	(4.7)

Discussion:

In this study, the mean age was found 35(±12) years & majority of the study patients were young adults of 18-35 years (58.9%). Mean age of GBS patients in another study done by[14] was found 34.75(±16.59) years. In our study incidence of GBS was slightly prevalent in male (58.1%) than female (41.9%), it has similarities with the one previous study[15]. History of preceding infection was found in 76.8 % of patients which coincides with the different study done in Bangladesh[16,13].

In this study all patients were presented with varying degree of weakness of all four limbs and other common symptoms were sensory complaints (44.2%), symptoms of autonomic dysfunction like lightheadedness on changing posture, palpitation, constipation, urinary retention and incontinence were present in 39.5% of the patients & cranial nerve palsy was found in 34.9% of cases.

The present study found predominant subtype AMAN (37.2%) followed by AIDP (32.6%) and AMSAN (20.9%). Around 9.3% (4) of the patients in our study constitute other group as they could not be categorized by any of the above subgroup. Three of them had normal NCS findings and one of them had regional variant. So axonal variants (AMAN and AMSAN) constitute the predominant subtype (58.1%) in our population. A study done in Bangladesh, also found higher frequency of axonal variants in 67% (AMAN 56% and AMSAN 11%) followed by AIDP in 22% of cases[13].

Incidence of autonomic dysfunction in GBS has been reported to vary considerably. Autonomic dysfunction in GBS probably occurs even more frequently than recorded as some of its manifestations are quite transient and require continuous monitoring. Sustained sinus tachycardia is the most commonly observed manifestation found in 37% of cases as described by different authors[18,19]. Sinus tachycardia was present in 25.6% of cases in our study. Sinus arrhythmia was found in only two of our patients. In this study hypertension was found in 16.3% and hypotension in 4.7% of cases.

Postural hypotension is another important and common manifestation in GBS. We had found 38.2% of patients with postural hypotension that coincides the other study[19]. The percentage of postural hypotension may be even higher as it could not evaluated in few patients in our study due to severe weakness.

Regarding bowel and bladder dysfunction we found 30% of patients had constipation but it was found in 15% of cases in another study [18]. Only 3 (7%) of the patient had urinary retention during the course of the illness and two of them had urinary incontinence.

As we observed only 31.2% (13) of the patients received definitive treatment among them 12 patients received plasma exchange and 1 patient was treated with intravenous immunoglobulin. Most of the patients were unable to receive these costly treatment due to financial constrain. The current study was done to detect autonomic dysfunction in addition to clinical features and treat accordingly thus helps those patients to reduce sufferings.

Conclusion:

GBS can be presented with variable presentation including autonomic dysfunction. In this study common clinical presentation was limb weakness & different patterns of autonomic dysfunction was found in patients with GBS. Common electrophysiological subtype was AMAN. So in addition to clinical & electrophysiological analysis autonomic evaluation is essential in every patients with GBS as autonomic dysfunction is one of important cause of mortality.

Ethical issues:

All patients gave informed written consents and the study was approved by Institutional Review Board of Bangabandhu Sheikh Mujib Medical University.

Conflict of interests:

The authors declare that they have no conflict of interest.

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