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Classification of Guillain-Barré syndrome based on electrophysiological features

Aysha Zafar
Assistant professor department of Neurology MTI,LRH hosptial peshawar

Saad Ali
Assistant professor department of Neurology MTI,LRH hosptial peshawar
Corrosponding Authors email : xs2drsaad@yahoo.com

Zia Ullah Gazi
Consultant neurologist dhq hospital timergira , lower dir
Corrosponding Authors email: Ziaqazi400@gmail.com

Arshad Iqbal
Consultant neurosurgeon dhq hospital timergira , lower dir

Sajid Khan
Assistant Professor department of neurosurgery Prime Hospital peshawar

Muhammand Shoaib
Senior registrar department of neurosurgery MTH hosptial Peshawar

***Abstract*---**Objective: Our study aimed to identify the most common subtypes of Guillian Barre Syndrome in our sample group and evaluate their electrophysiological features to better understand the disorder. Materials and methods: Between January 2020 and February 2021, we gathered information from patients diagnosed with Guillian Barre Syndrome and referred to the Neurology department at Lady Reading Hospital. Results: We enrolled 39 people with Guillian Barre Syndrome; 26 were male (67%), whereas 13 were female (33%). Based on electrophysiological analyses, axonal diversity is most common (AMAN followed by AMSAN). The average age of a patient with AMSAN was 39.2 21.8 years, but those with the demyelinating form were only 28 14.5. Springtime was the greatest incidence of GBS with 13 cases (33%), followed by fall with 12 cases (31%). Conlusion: A significant incidence of the axonal variety of [Guillain-Barré Syndrome] was found in our research, which was conducted in Khyber Pakhtunkhwa, Pakistan.

***Keywords*---**Classification, Guillain-Barré Syndrome, Electrophysiological ,Features

Introduction

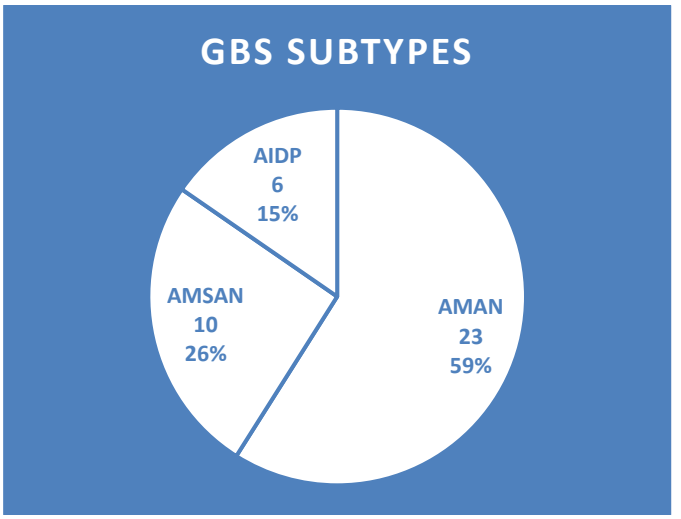
In the category of immune-mediated illnesses of the peripheral nerve system, Guillian Barre Syndrome is included (1). An estimated 1-2 new cases of GBS are diagnosed per 100,000 people each year, with males being affected more commonly than women (2). Subtypes of GBS might vary by region (3). Despite the significance of clinical observations and laboratory analyses, electrophysiological studies are ultimately necessary for classifying the different forms of GBS. Acute motor axonal neuropathy (AMAN), acute motor sensory axonal neuropathy (AMSAN), and acute inflammatory demyelinating polyneuropathy are the three primary subtypes of GBS based on nerve conduction investigations (AIDP). The subtypes of GBS tend to vary by location. (5) An electrophysiological study's value extends beyond identifying Guillain-Barré syndrome; it's also useful for ruling out related myopathic and neuropathic disorders (4). Early diagnosis is critical in GBS care since it increases the likelihood of a positive outcome from treatment (3). The electrophysiological features of a GBS patient may be used to predict the patient's prognosis in the long run (2).One major goal of our research was to quantify the frequency of different GBS subtypes in the province of Khyber Pakhtunkhwa.Distinctions across GBS subtypes in terms of electrical activity.Electrodiagnosis, Guillian Barre syndrome subgroups, and related terms(6).

Materials and methods : Over a year, patients diagnosed with GBS were transported to Lady Reading Hospital in Peshawar. Retrospective neurophysiological data was analysed from January 2020 to February 2021. Age, gender, and illness season were also obtained.

All of these patients underwent an EEG with surface electrodes and an NCS stimulator. We employed sensory and motor antidromic NCS. We picked the median, ulnar, sural, and peroneal nerves for sensory study. Amplitude, CMAP, distal delay, nerve conduction velocity (NCV), conduction block (CB), and temporal dispersion (TD) were evaluated. NCV was used to evaluate SNAP and peak latency.Medical records were evaluated to exclude GBS patients with normal or near-normal electrophysiological results. Pure sensory axonal neuropathy and Miller-Fisher syndrome weren't considered. Cases came under AMAN, AIDP, and AMSAN. Albers and Kelly diagnosed AIDP. (6).

Results: The study included a total of 39 participants. There were 26 males (67% of the total) and 13 females (33%). The youngest was 15, the oldest was 60, and the mean age was 31.82 We classified 39 patients using electrodiagnostic criteria as AMAN (59%), AMSAN (25.6%), or AIDP (15.3%).

Figure 1.statistics on the number of patients of AMAN,AMSAN,and AIDP



Statistics on the number of patients are provided. AMAN AMSAN, or Acute motor and sensory axonal neuropathy; AIDP are the same disease.

The CMAP amplitudes of AMAN patients were smaller, but their SNAPs were normal. Conduction study findings for the median nerve across GBS subtypes are shown in Table 1. Patients with AIDP had slower conduction velocities and longer distal motor latencies compared to those with AMAN. In both groups, CMAP amplitudes are similarly high. The conduction block and aberrant temporal dispersion were seen in three individuals with AIDP. SNAP amplitudes were higher in those with AMAN. Sensation was aberrant in four of the AIDP patients, but not one AMAN patients.

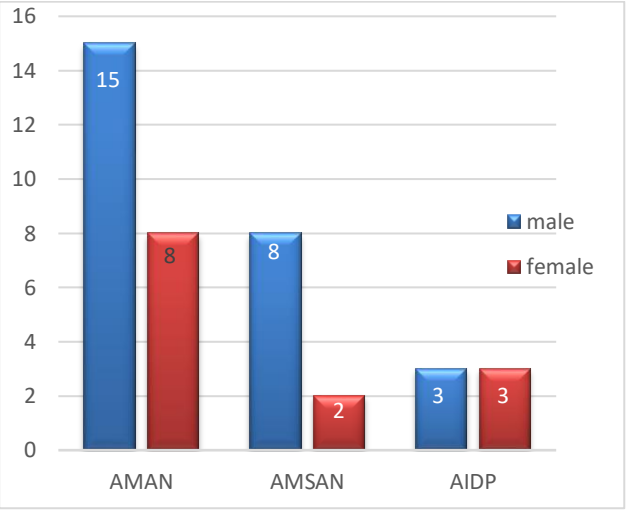
[Table 01]. Patients with AMAN and AIDP A Compared Peripheral Nerve Conduction Study

[Motor]	**[AMAN]**	**[AIDP]**
[Distal latency (ms]	[3.08]	[5.83]
[Conduction velocity (m/s]	[50.32]	[35]
[CMAP Amplitude mV]	[3.04]	[2.9]
[Sensory]		
[Conduction velocity (m/s)]	[60]	[43.2]
[SNAP Amplitude (uV)]	[31.24]	[19.2]

The displayed values are the means.

Neuromuscular junction potential (NMJP), compound muscle action potential (CMAP), and afferent axon reflex (SNAP),and acute [motor axonal neuropathy] (AMAN) are all measures of the function of the nervous system (SNAP).26 (67%) of the 39 cases were men, whereas 13 (33%) were women. The following table displays the categorization of GBS by gender. Sixty-five percent of the AMAN members were men, whereas just 35 percent were women. About 80% of the AMSAN members were men and 20% were women. Both sexes made up 50% of the AIDP population.

Figure 2. Gender wise distribution of subtypes of GBS.



The number of patients is reflected in quantitative statistics.
AMAN AMSAN, Numbers of patients are reflected in quantitative data.

With ages ranging from 15 to 60, the average was 32. A breakdown of GBS types by age is shown in Table 2. Those in the AMAN cohort were, on average, 30, those in the AMSAN cohort, 39, and those in the AIDP cohort, 28.

[Table 02]. Subtypes of GBS as a function of age

	[AMAN]	**[AMSAN]**	**[AIDP]**
[All patients]	[30]	[39.2]	[28]
[Male]	[29]	[39]	[28]
[Female]	[31]	[40]	[28]

That seasonal pattern was very noticeable. Thirteen (33.3%) cases were found in the spring (March–May), twelve (31.5%) in the autumn (September–November), and seven (18.3%) in the summer (June–August) and winter (December–February) (December to feburary).

Discussion: We analysed data from 39 patients in our study. There are twice as many males as females in this country. Our results are consistent with the widespread belief that men are more likely to be diagnosed with GBS than

women. The average beginning of GBS is not until age 31.8, which is a rather young age. GBS rates rise with age in North America and European nations. 7. The AMAN and AMSAN communities are mostly male. Though the ratio of male to female AIDP members is 1:1. The mean age of AMSAN patients is higher than that of AMAN and AIDP patients. This is consistent with earlier research, including one from Iran that found a higher prevalence of AMSAN among the elderly. Subtypes of GBS do not vary in prevalence with age groups or sex.

There are a number of different forms of GBS. (3, 4). There is a strong geoFigureical variance across the subtypes, with AIDP predominating throughout Europe and North America. 69% were found to be demyelinating, 3% axonal, and 23% were unsure (9). Axonal variations (AMAN then AMSAN) were found to be more common than demyelinating patterns in our analysis. According to Hene, the incidence of axonal type GBS in our province is comparable to that reported in other Asian nations, such as Iran (8), India (9), China (10), and Japan (11). Although our analysis found the axonal variety to be more common than the demyelinating one, the difference between the two is still statistically significant when comparing Pakistani and Western populations.As the seasons change, so does the weather. We found that most of the axonal variations (64% of the total) occurred between October and April. This is possibly because viruses and respiratory tract illnesses are more common in the spring and fall. Prevalence was found to be highest in the fall and winter, according to one study conducted in Iran. Some seasonal fluctuation in GBS cases may possibly be attributable to the fact that these patients sought second opinions from specialists at various tertiary care facilities. This means that multicenter investigations are necessary to determine the true seasonal fluctuations of GBS (13).

Conclusion: Results from studies conducted in Asia indicate that the axonal form of GBS is more common than the demyelinating form. Consistent with earlier research, ours showed a comparable frequency, age, and sex distribution. It was shown that several GBS types exhibited seasonal differences.

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