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SEASONAL VARIATION AND SEX DISTRIBUTION IN PATIENTS WITH GUILLAIN-BARRE SYNDROME

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ABSTRACT

Seasonal variation and gender preponderance have not been adequately studied in Guillain-Barre syndrome (GBS). We conducted a prospective study to investigate differences in GBS incidence between males and females and across different seasons of the year. Patients were recruited from neurology inpatients at Lahore's Mayo Hospital, as well as those referred to our facility for nerve conduction tests. Twenty five consecutive cases were registered over one year. Of these 21(84%) were males and 4 (16%) were females, with male to female ratio of 5.5:1. Incidence was higher in summer months (April to September) when 16 (64%) patients presented, while in winter (October to March) only 9 (36%) patients presented. Small peaks of incidence were found in April-May when 24% and July-August when 32% patients presented. We conclude that males are affected more than females in GBS and the condition occurs throughout the year with small peaks of incidence in different parts of the year, especially summer.

Guillain-Barre syndrome (GBS) is an acute, immune-mediated polyneuropathy characterized by progressive flaccid weakness of more than one limb, areflexia and absence of any other identifiable cause along with albumino-cytological dissociation in cerebrospinal fluid.¹ GBS has a worldwide distribution affecting both males and females from age 08 months to 81 years with somewhat more susceptibility reported in females and no seasonal variation.² Incidence has been estimated to be 0.8 to 1.8 per 100,000 persons per year.³

On the other hand, seasonal variation has been found in some western and Pakistan-based studies.^{4,5} Male preponderance has also been reported.⁶ These accounts suggest a heterogeneity regarding the epidemiology and electrophysiological pattern of GBS. We undertook this study to formulate an assessment on the epidemiology of GBS in our setting, especially the questions of any seasonal variation and male or female preponderance.

Although GBS is a sporadic disease extending throughout the year, seasonal, identifiable outbreaks - such as those in Columbia and Jordan - have occurred where the number of cases exceeded the expected incidence by 20-400 times.^{7,8} Another outbreak occurred in the United

States in 1976 after immunization of 45 million people against swine influenza. There have been two outbreaks of GBS in South America after rabies vaccination.⁹ Furthermore there occurred two outbreaks in 1985, one in Finland after vaccination against poliomyelitis and the other in Japan without any identifiable cause.¹⁰

METHODS

This prospective study was conducted in the Department of Neurology, Mayo Hospital, Lahore. The study period started with the entry of first patient and extended over the period of one full year. All patients admitted to the neurology department and those admitted in other medical departments of Mayo hospital or elsewhere, and those referred for specialists' opinion or nerve conduction studies were included in the study. A detailed history from the patient or a relative was taken and complete neurological examination was performed along with examination of other systems. Inclusion criteria were: (a) patients fulfilling the NINCDS criteria for Guillain-Barre syndrome; patients of all age groups; patients of both sexes. Suspected cases of diphtheria, porphyria, hepatitis and viral xanthelasma were excluded.

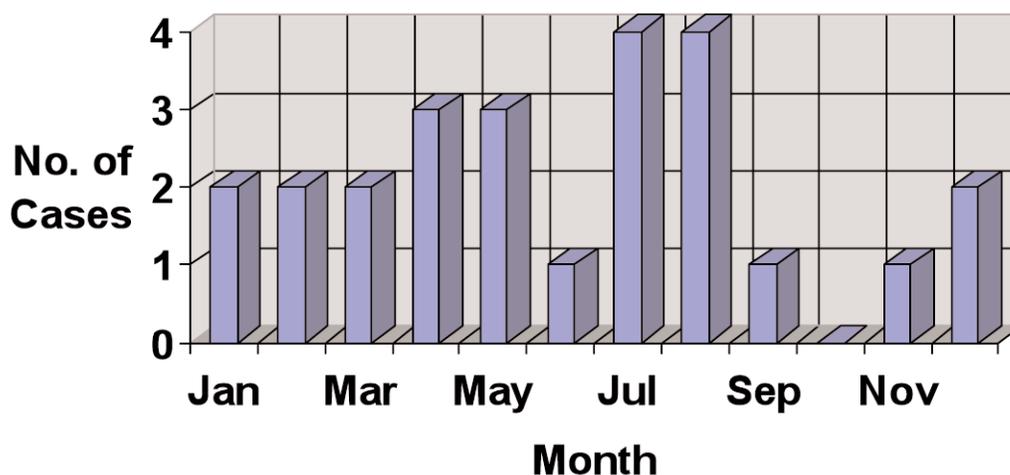


Figure 1. Presentation of cases by month

RESULTS

Demographics

During the study period, twenty five consecutive patients were registered. Of these, 21 (84%) patients were male and 4 (16%) patients were females, with male-to-female ratio of 5.2:1.

The age of the patients ranged from 7 years to 70 years, with a mean of 34.72 years. Most patients (n=20, 80%) belonged to the age group 11-50 years, with peak incidence between 11-30 years, which comprised 12 (48%) patients. There were 8 (32%) patients in the age group 31-50 years and 4 (16%) in the age group 51-70 years. There was only 1 (4%) patient who presented below the age of 10.

The age range of 21 male patients was between 7-70 years with a mean of 34.14 years. Most patients (n=17, 80.93%) presented between 11-50 years with peak incidence between 11-30 years, which comprised 10 (47.61%) patients. There were 7 (33.33%) patients in the age group between 31-50 years and 3 patients (14.28%) between 51-70 years. Only 1 patient (4.76%) presented before the age of 10.

Four females presented at the ages of 18, 30, 38 and 65 years, with a mean of 37.8 years.

Seasonal Variation

GBS incidence was much higher in summer months (April-September), during which 16 (64%) patients presented,

whereas in the remaining half of the year (October-March) only 9 (36%) patients were seen.

Overall, patients were distributed throughout the four quarters of the year, with 7 (28%) presenting in April-June, 9 (36%) in July-September, 3 (12%) in October-December, and 6 (24%) presenting in January-March. Peaks of incidence were noted in April-May (n=6, 24%) and July-August (n=8, 32%).

DISCUSSION

We prospectively studied 25 patients of Guillain-Barre Syndrome over a period of one year. Clinical diagnosis was confirmed by appropriate laboratory tests and electrophysiological studies.

Although patients presented throughout the year, small peaks were found at certain times, with the highest incidence in July-September. The overall incidence was higher during summer months (April-September). In one study, Nasrullah et al reported that the presentation of GBS was most common between the months of July-October where 10 out of 17 (58.8%) patients presented, which is similar to our study.⁴ Higher peak incidence in the form of summer epidemics is also reported by Hughes et al in northern China.⁶ Baoxan et al in Beijing noted an increased incidence in late summer and early fall (July-October), which they attributed to the increased frequency of enteric infections at that time of year.¹¹ Higher seasonal preponderance in spring (March-May) in Taiwan⁵ and in autumn from Stockholm is also reported.¹² Clustering of GBS patients is also reported by Ismail et al

in winter and spring from Kuwait.¹³ In contrast to the above studies, a significant relationship between season and Guillain-Barre Syndrome was not found by Hahn et al and Emilia-Romagna et al.^{14,15}

It is evident from the above discussion that incidence of GBS is distributed throughout the year but small peaks of higher incidence are found in different parts of the year, particularly in warmer parts of the year, especially from Asian countries. Although no clear seasonal preponderance is reported in western studies, there are a few from Scandinavia which report higher incidence in autumn. This seasonal preponderance in Asian countries may be related to peaks of gastrointestinal infection in summer and infections of the respiratory tract in winter.

Males overwhelmingly outnumbered females in our study. Although male preponderance is reported in most GBS series, it was found to be much higher in our study. Male preponderance (109/167, 65%) is reported by Lyu et al and was seen in both demyelinating and axonal sub groups.⁵ Higher prevalence in males is also reported by Hughes et al, with a male to female ratio of 1.25:1.⁶ Male preponderance is also reported by Nasrullah et al⁴ and Emilia-Romagna et al.¹⁵ The much higher male preponderance in our study may be due to higher exposure to infections to males in our community; alternatively, females (especially those with mild weakness) might not have presented for medical attention due to social limitations in our part of the world.

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