THE SEASONAL VARIATION OF GUILLIAN-BARRE SYNDROME IN IRAQ

A. M. Abdul-Kareem[1] *FRCP*, **Hasan A. Al-Hamdani**[1] *FICMS*, **Muayed B. Al-Rikabi**[2] *FICMS*

Abstract

Background: Guillain-Barre syndrome is viewed as reactive, autoimmune disease triggered by a preceding bacterial or viral infection. The variety of antecedent infections may contribute to the clinical and immunologic heterogeneity of the syndrome. No seasonal variation in the incidence of Guillain-Barre syndrome was found in many surveys in the most of western countries. But there was seasonal preponderance found in Taiwan, Sweden and Saudi Arabia.

Objective: To evaluate the distribution of the numbers of cases admitted to the hospital over different months of the year for significant seasonal variation in the incidence of Guillain-Barre syndrome.

Patient & Methods: The monthly rate of admission of patients with Guillain-Barre syndrome was obtained as recorded in hospital discharges data during the years 1993-1995 and 1999-2001 from the university Hospital of Iraqi Medical College. Patients were examined and diagnosed according to Asbury criteria. . A total of 98 patients were studied for age, sex and distribution over different months of the year.

Result: Statistical analysis of the number of the cases admitted to the hospital each month by rejection null hypothesis of no difference in frequency of admission from an average eight cases per months by P (χ^2)=0.007. There was a significant seasonality of Guillain-Barre syndrome with a peak incidence in May and June. The higher incidence of Guillain-Barre syndrome in the study was below the age of twenty years with male: female ratio of 3:2.

Conclusion: There was a significant seasonality of Guillain-Barre syndrome with a peak incidence in May and June.

Keywords: Guillain-Barre syndrome

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Introduction

Guillian-Barre syndrome (GBS) also known as acute inflammatory demyelinating polyradiculo-neuropathy is a common cause of acute generalized paralysis, with an estimated incidence of 1.5 to 2 cases per 100,000 population[1]. It affects both genders, involves people of all ages, is reported worldwide, and in the post-polio era, it is the most common cause of an acute generalized paralysis[2].

The diagnosis of GBS requires the presence of relatively symmetric progressive muscle weakness and areflexia. Cerebrospinal fluid findings that support the diagnosis are an elevated protein content with a normal cell count. Electrophysiological studies provide confirmation of the diagnosis with evidence of a demyelinating polyneuropathy[1].

In the early phases, laboratory tests are helpful only to exclude other disorders that can resemble GBS. Electrodiagnostic features may be minimal and the cerebrospinal fluid protein level may not rise until in the end of the first weak. If the diagnosis is strongly suspected treatment should be initiated without waiting for evolution of characteristic electrodiagnostic and CSF finding to occur[3].

The variety of antecedent infections may contribute to the clinical and immunologic heterogeneity of GBS. Multivariate analysis showed that in GBS patients, infections with campylobacter Jejuni, cytomegalovirus, and Epstein-Barr virus were significantly more frequent than in controls[4]. Mycoplasma pneumonia infections occurred more often in GBS patients than in controls in univariate analysis. Infections with Haemophilus influenzae, Para influenza I virus, influenza A virus, influenza B virus, adenovirus, herpes simplex virus, and varicella zoster virus were also demonstrated in GBS patients, but not more frequently than in control[4].

No seasonal variation in the incidence of GBS was found in many surveys in the most of western countries[5,6]. But there is seasonal preponderance in spring was found in Taiwan[7]. There was a moderate but significant seasonality with a peak in August[7], particularly among the

[1] Dept. Medicine-Section of Neurology [2] Dept. Medicine-Section of Cardiology, College of Medicine, Al-Nahrain University.

Address correspondence to Dr. Hasan A. Al-Hamdani, Al-Kadhimiya Teaching Hospital, P.O.Box 70041.

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young age groups observed in Sweden[8]. A seasonal peak was found in winter in Saudi Arabia[9].

Patients & Methods

A hospital based retrospective study. We obtained the monthly rate of admission of patient with GBS as recorded in hospital discharges data during 1993-1995 and 1999-2001 from the university Hospital of Iraqi Medical College and they were collected and studied. These years were chosen according to the availability of the data in the hospital records. Patients were examined and diagnosed as GBS according to Asbury and Cornblath criteria[10]. A total of 98 patients were studied for age, sex and distribution over different months of the year.

The total of patients were recorded, they were referred from different hospitals and private clinics from different parts of Iraq for evaluation and management. GBS cases referred to the teaching hospitals due to accessibility of the respiratory Care Units in these hospitals. Many patients referred to the Respiratory Care Unit directly.

Statistical analysis of the age, sex and number of the cases admitted to the hospital each month. The results were recorded and analyzed and organized into tables and graphs to show sex and ages as well as distribution of the number of the cases admitted to the hospital each month.

Results

The study included 98 cases of Guillain-Barre syndrome 59 males (60.2%) and 39 females (39.8%) admitted within the six years of study. The number of patients who were involved in the study in each calendar month is shown in (table 1).

Table 1: Frequency distribution of GB cases by year and month of admission

	1994	1995	1996	1999	2000	2001	Total
January	2	3	0	2	0	2	9
February	1	5	0	3	0	1	10
March	0	5	1	2	1	1	10
April	0	0	2	0	1	1	4
May	0	2	1	7	2	5	14
June	2	1	2	3	2	6	17
July	3	0	0	1	2	1	7
August	1	0	2	1	1	1	6
September	0	0	1	0	1	1	3
October	1	1	1	1	1	0	5
November	1	1	0	0	2	0	4
December	3	0	2	1	1	1	8
Total	14	18	12	20	14	20	98

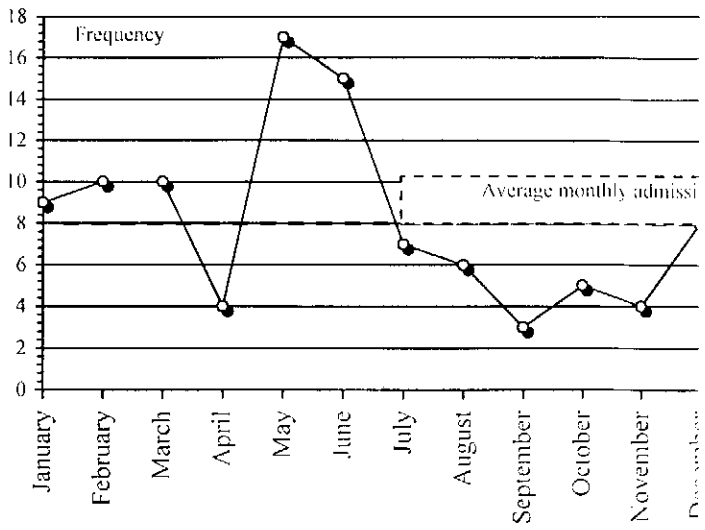

Figure 1: Bar chart showing the time trend of 6 years total monthly admission of GB cases

Statistical analysis of the number of the cases admitted to the hospital each month by rejection null hypothesis of no difference in frequency of admission form an average eight cases per months. P (χ^2)=0.007 for the null hypothesis that the observed monthly frequencies do not significantly differ from an average of eight cases/month.

There was a significant seasonality of Guillain-Barre syndrome found with a peak incidence in May and June (Figure 1).

In (table 2) gender distribution in the study show Male: Female ratio of 3:2. The higher incidence of Guillain-Barre syndrome in the study was below the age of twenty years (Table 2 and Figure 2).

Table 2: showing the distribution of the study sample by age and gender

	Number	%
Age (years)		
<10	27	27.5
11-20	38	38.8
21-30	9	9.2
31-40	5	5.1
41-50	5	5.1
>51	14	14.3
Gender		
Female	39	39.8
Male	59	60.2
Total	**98**	**100**

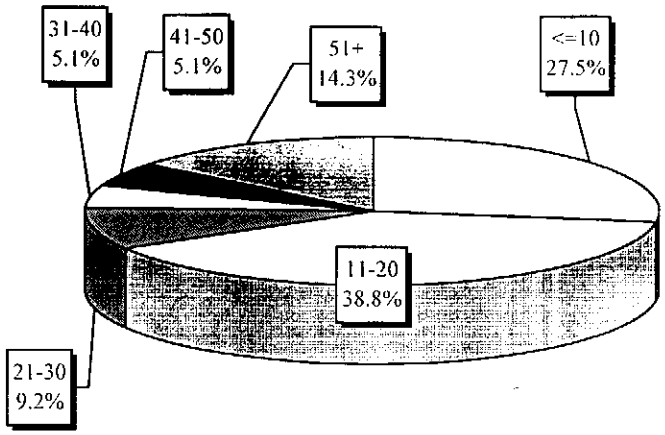

Figure 2: Pie chart showing the distribution of the study sample by age

Discussion

Guillain-Barre syndrome is viewed as reactive, autoimmune disease triggered by a preceding bacterial or viral infection[11]. More recently a distinction has been made between pure motor forms, severe sensory form, and primary axonal and primary demyelinating varieties[12].

There was a significant seasonality of GBS with a peak in May and June and another peak in February and March. There is seasonal variation in the same geographical distribution and there is variable distribution and seasonal difference in the antecedent infection in the different parts of the world.

Various diseases are described as antecedents of the syndrome particularly gastroenteritis and respiratory infectious diseases, but epidemiological survey is rare[13].

Hughes-Ra and Ree-JH claimed that there is no seasonal variation in the western countries because the most frequent antecedent events, respiratory and enteric infections have opposite seasonality[6].

C Jejuni a major cause of bacterial gastroenteritis worldwide has become recognized as the most frequent antecedent pathogen for GBS. Serological or culture evidence of a recent C. Jejuni infection ranged from 26 to 41% in series of sporadic GBS cases from the UK, the Netherlands, the USA and Japan[11]. Cytomegalovirus antecedent infection, account for 13% in Guillain Barre syndrome[4]. A seasonal DNAemia variation in cytomegalovirus seropositive subject was found by Dumon et al. in 2001[14].

In china in 1995, forty cases of GBS were reported, in that the clinical electrophysiological and pathological features of GBS in north China were similar to those of atypical GBS cases in western countries, though there seemed to be some special epidemiological features in age, seasonal and regional distribution[15].In northern China, serological evidence of recent C. Jejuni infection was found in 66% of GBS patients in rural area, as opposed to only 16% of village controls[11]. This may explain the yearly epidemics among rural children in north China.

In Japan, Hao Q et al suggest that Campylobacter Jejuni- associated GBS was more frequent in early spring than in other season [16].And van-der-Meche-FG et al found that Campylobacter Jejuni infection are the most frequent trigger of the Miller Fisher syndrome[17].Seasonal preponderance in spring was found in GBS patients in Taiwan and high frequency of fissure syndrome not seen in other series[7]. This observation strongly suggests the association between the peculiar type of GBS and Campylobacter Jejuni infection.

In a study done in our country cytomegalovirus infection was found in 14.3% of the patients which is comparable to the findings in other series, but Epstein-Barr virus was found to be less frequent and herpes simplex virus (HSV-1) acute infection was found in 28.6% of the patients, which is significantly high[18].

So the seasonal variation in the same geographical distribution may be related to the variable distribution and seasonal difference in the antecedent infection in the different parts of the world. And seasonal difference in Iraq may be related to the high incidence of HSV-1 antecedent infection incomparable to the western countries.

The higher incidence of Guillain-Barre syndrome in the study was between the ages of 11-20 years. Most surveys show a slight peak in late adolescence and young adulthood[11]. In our study there is a small peak at age above 50 year, which is compatible to the series of Hughes and Rees[19], and high incidence in age group less than 10 years similar to what is found in Taiwan[7]. The variation in age distribution may also be related to the incidence of the antecedent infections among the age groups.

Male predominance in this series is compatible to the series of Al-Araji[17] and Bahou YG in Saudi Arabia[9] with no definite explanation.

Conclusion: There was a significant seasonality of Guillain-Barre syndrome.

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