

## **THE CHRONOLOGICAL VARIATION OF GUILLAIN-BARRÉ SYNDROME (GBS) IN NORTH WEST OF IRAN**

### **THE CHRONOLOGICAL VARIATION OF GUILLAIN-BARRÉ SYNDROME (GBS) IN NORTH WEST OF IRAN**

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#### **ABSTRACT**

##### **BACKGROUND:**

Guillain-Barré syndrome (GBS) is an acute peripheral nervous system neuropathy which affects motor, sensory and autonomic nerves as well as spinal roots. The purpose of this study was to describe the varieties in chronological incidence of GBS in North-West of Iran, based on information from a retrospective survey in a well defined large population.

##### **MATERIALS AND METHODS:**

Imam Reza Hospital in Tabriz is a referral center for population in North-West Iran. GBS is one of diseases commonly referral to neurological ward of this hospital, originated from all cities in East Azarbaijan province and other neighboring provinces. All of patients with GBS symptoms admitted into neurological ward from September 20, 2005 through September 20, 2008 were enrolled in the study, so that GBS cases all together were confirmed with EMG-NCV study. All data were analyzed with SPSS version 15.0. Descriptive statistical tests were used for all of them.

##### **RESULT:**

Our analysis showed a decreased in GBS incidence in the first month of winter and summer. On the contrary an increase occurred in spring and autumn. The most incidence was in May and the least one in September.

##### **CONCLUSION:**

According to this variation and high prevalence of respiratory infections at the end of autumn and increase in underground water in winter and beginning of spring with due to four weeks incubation period of GBS, it seems that there might be a relation between these conditions. But to prove this, it is necessary to be aware that of an epidemiologic and serologic studies to achieve a net result.

Key wards: Guillain-Barré syndrome, seasonal variation, North-West of Iran

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### **INTRODUCTION:**

Guillain-Barré syndrome is an acute autoimmune disorder affecting peripheral nervous system usually triggered by an acute infectious process.

It is essentially included in the wider group of peripheral neuropathies. There are several types of GBS, but unless otherwise stated, GBS refers to the most common form AIDP [1-4]. Since eradication of poliomyelitis, GBS became the first cause of acute flaccid paralysis in western countries [5].

Although of reported in geographic population in recent decades, GBS incidence rate varies from 0.2 up to 4 per 100,000, but most of them are in 1-2 per 100,000. Only 10 reports out of 39 series included more than 100 GBS cases [6-15]. The study from Ontario and Quebec (Canada) which was based on hospital services databases include more than 2000 cases [12]. False positive rate of GBS diagnosis were 26% in Ontario, 21% in Quebec and 17% in South-West Stockholm between years 1973 and 1991[16]. in most surveys case finding was done retrospectively. Since 1980, researches adopted National Institute of Neurological and Communicative Disorders and Stroke (NINCDS) diagnostic criteria for GBS [17]. Most thorough clinical description of GBS was generated from large case studies [18-20].

Reasons for the fragmentary knowledge about the clinic epidemiological aspects of GBS are:

- 1) The small numbers of cases in incidence studies,
- 2) The limitations of the retrospective approach, and
- 3) The variations in traditions of care with time and disease severity.

The purpose of this study was to describe the varieties in chronological incidence of GBS in Tabriz (North-West Iran), based on information from a retrospective survey in a well-defined large population.

### **METHODS AND MATERIALS:**

#### ***Geographical area and population:***

Tabriz, the capital city of east Azarbaijan, is the largest city in North-West Iran. It is located at latitude 38°, 8' N and longitude 46°, 15' W. Resident population of North-West Iran is 101009827.

#### ***Season definition:***

In Iran spring was started from 21 march up to 21 June, summer is from 22 June up to 22 August, Autumn is from 23 August up to 21 December and winter is from 22 December up to 20 March.

#### ***Case finding:***

Because of Imam Reza Hospital in Tabriz being a referral center in North-West Iran, all the patients with complications or needing intensive care are referred to this center. GBS is one of disease which is referred to neurological ward of this hospital from all cities in East Azarbaijan province and other neighboring province.

#### ***Study Setting***

This study is based on descriptive retrospective data. All of patients with GBS symptoms who were admitted into neurological ward from September 20, 2005 through September 20, 2008 which enrolled in this study including GBS cases confirmed with EMG-NCV study. We didn't divided patients in the subtypes.

#### ***Databases***

Two main databases were used in the study. One is the hospital admission documents which were held in hospital medical record file, and the other was data in the ward's admission book.

#### ***Data:***

All days, months and years of admission were extracted and written down. To know in which

## THE CHRONOLOGICAL VARIATION OF GUILLAIN-BARRÉ SYNDROME (GBS) IN NORTH WEST OF IRAN

month, GBS has high incidence, we omitted the year in our calculations.

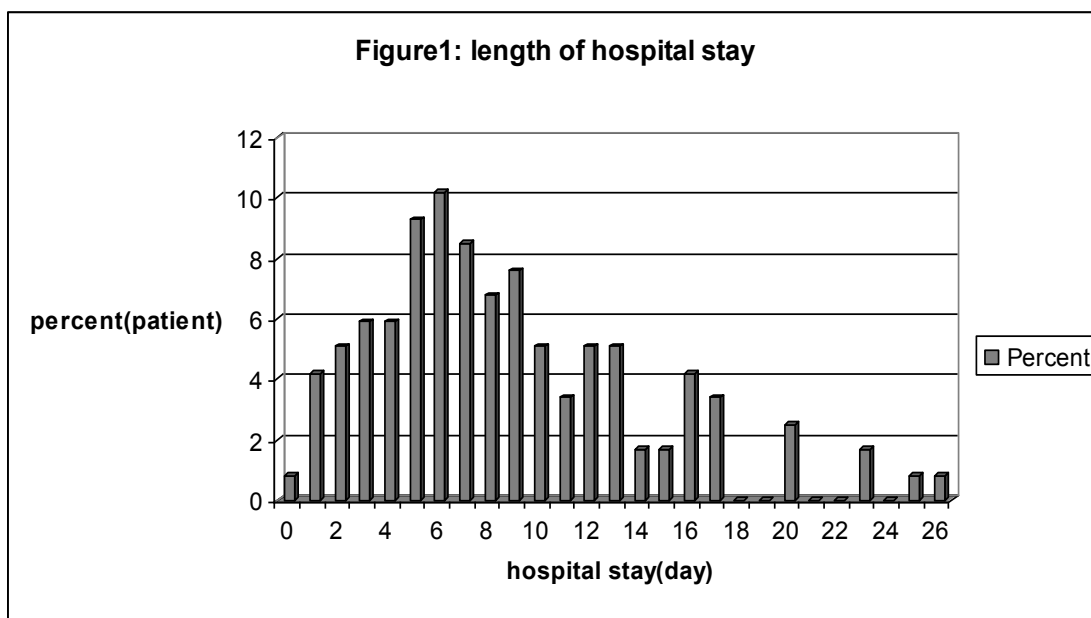
### **Data Analysis**

All data were analyzed with SPSS version 15.0 and descriptive statistical test were used for all of them.

### **Result:**

The study included a total of 118 patients with GBS. The mean age of patients was  $46.8 \pm 20.7$  years old. The youngest and oldest patient was in 14 and 85 years old respectively.

The majority of patients were male (57.6%) and 42.4% of them were female. The mean period of hospitalization was  $8.7 \pm 5.5$  days but most of patients stayed only for 6 days (mode=6) (Figure 1).



96.6% of the patients cured and discharged; 3.4 % of patients expired.

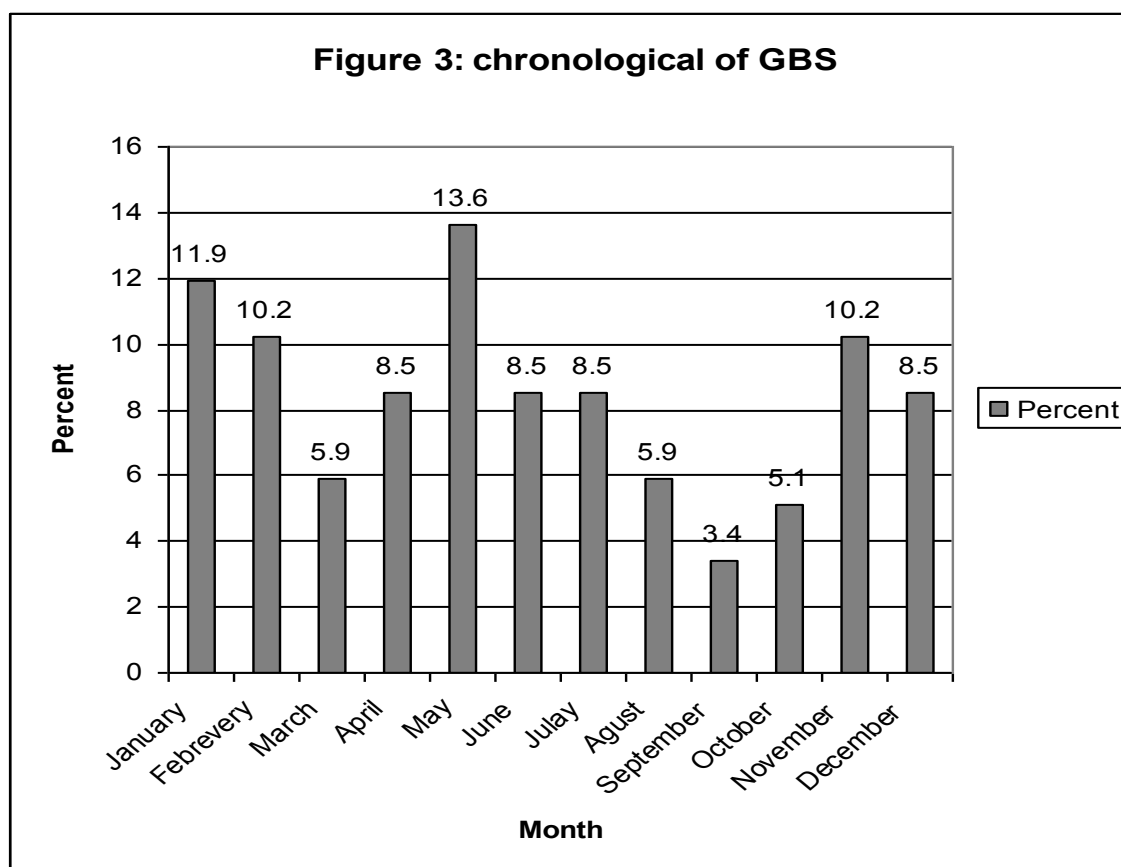
### **Seasonal variation**

This analysis shows that the incidence of GBS decrease from the first month of winter and

increasing in spring and the highest incidence is in May, then it goes down in the summer and the lowest incidence is in September, in the fall it goes up.

GBS in the latter of fall and the beginning of winter and in mid of spring have high incidence (Figure 2).

## THE CHRONOLOGICAL VARIATION OF GUILLAIN-BARRÉ SYNDROME (GBS) IN NORTH WEST OF IRAN



### DISCUSSION:

We prospectively studied 118 patients of Guillain-Barre Syndrome over a period of three year .

Clinical diagnosis was confirmed by appropriate laboratory tests and electrophysiological studies.

About two-thirds of GBS patients had an infection within a 6-week period prior to the diagnosis [21], generally a flu-like episode or gastroenteritis [22]. Organisms that are most likely to be involved in the infections were *Campylobacter jejuni*, cytomegalovirus, and Epstein - Barr virus and *Mycoplasma pneumoniae* [23, 24 ).

AMAN type, which affects most of the Chinese and the Japanese patients, is frequently associated with a previous *C. jejuni* infection. However, few

patients with influenza or gastroenteritis will develop GBS. Attempts to identify an immunogenetic profile were able to explain that host susceptibility was usually unsuccessful, with a few exceptions on HLA in specific populations [23,24.]

According to high prevalence of respiratory infectious at the end of autumn with due to 4 weeks incubation period of GBS and increase in underground water in the winter and beginning of spring, it seems that there is a relation between these conditions; but it is necessary that an epidemiologic and serologic study to be done to achieve a net result. In our study because of being retrospective, we can not recognized the prevalence of URI and

## THE CHRONOLOGICAL VARIATION OF GUILLAIN-BARRÉ SYNDROME (GBS) IN NORTH WEST OF IRAN

infections with GI; it will be better done in the prospective with attention to recent infections to find any possible relations

Nasrullah et al reported the high presentation of GBS between the months of July-October.[25]

In Northern China Hughes et al presented higher peak incidence in the form of summer epidemics.[26]

Increased incidence in late summer and early fall(July-October)which attributed to the increased frequency of enteric infections is reported by Baoxan et al.[27]

In one study there was a high incidence in spring(March-May)in Taiwan[28]and in autumn from Stockholm.[29] which is similar to our study.

In contrast to the above studies and also our study, Hahn et al and Emilia-Romagna et al did not find a significant relationship between season and GBS.

[30,31]

It is evident from the above discussion that GBS can be presented throughout the year but there are small peaks of higher incidence in warmer parts of the year, especially in Asian countries.

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**THE CHRONOLOGICAL VARIATION OF GUILLAIN-BARRÉ SYNDROME (GBS) IN NORTH WEST OF IRAN**

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