

## Clinical and Epidemiological study of Landry Guillain – Barre’ syndrome and its Complications

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### Abstract

**Background-** Acute inflammatory polyradiculoneuritis, the Guillain-Barre’ Syndrome (GBS) has come to be accepted as a clinical entity, although the boundary between it and chronic inflammatory demyelinating polyneuropathy has given rise to discussion. **Objectives-** To study the various epidemiological, clinical features of patients admitted with Guillain-Barre’ Syndrome and complications in these patients. **Methods-** All adult patients, diagnosed as Guillain-Barre’ Syndrome, who strictly complied with the NINCDS criteria, admitted to Christian Medical College and Hospital, Ludhiana from 1st July 1988 to June 30th 1993 were included in this study. This includes a retrospective study of four years and prospective study of one year. Ninety seven patients entered the study. SPSS (Version 22.0) was used for analysis. **Results-** the incidence of GBS was more in the younger group. 70% of our cases were below 40 years of age. 80.34% were males and 19.65% were females. The agriculturists formed the maximum number of patients (32%) under study followed by students (22%) and house wives (16%). upper respiratory tract infection was present in the maximum number of patients (72.8%). dysautonomia was seen in 54.6% of patients. Twenty one patients (21.6%) received prednisolone and 4 (19%) of the group expired. 76 patients (78.2%) did not receive prednisolone and 21 (27.6%) patients expired in this group. **Conclusion-** There was no significant difference in the outcome of patients who received and who did not receive prednisolone as the treatment modality.

**Keywords-** Guillain Barre Syndrome, demyelinating diseases, dysautonomia, poluradiculoneuritis, nerve conduction.

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### Introduction

Acute inflammatory polyradiculoneuritis, the Guillain-Barre’ Syndrome (GBS) has come to be accepted as a clinical entity, although the boundary between it and chronic inflammatory demyelinating polyneuropathy has given rise to discussion [1]. Recent observations have suggested that the GBS may represent the consequence of more than one pathological mechanism. In most cases the salient pathological change is demyelination [2]. The disease is typically a monophasic illness with progressive weakness over 1-3 weeks followed by recovery. A mild respiratory or gastrointestinal infection precedes the neuritic symptoms in 70% of cases. In others, there may be a preceding history of surgical procedures, other viral illnesses [3], Mycoplasma infection and Lyme’s disease. Administration of antirabies vaccine and influenza vaccine given in 1976 in the USA were associated with a several-fold increase in the incidence of GBS [4]. The mean annual incidence rate is 1.7 per 100,000 population. The course of the disease can be divided into three parts: the progressive phase, the plateau phase and the recovery phase [5]. The major clinical manifestation is weakness which evolves more or less symmetrical over a period of several days to four weeks. Proximal as well as distal muscles are involved with lower extremities being involved earlier than the upper. Trunk, intercostal, neck muscles and cranial nerves are affected later. Weakness usually progresses to total motor paralysis and death may occur from respiratory failure in a few days [6]. Most of the patients have pain resembling muscular discomfort following exercise early on in the illness. Paraesthesias are common. Weakness develops rapidly but muscle atrophy does not occur. Facial diplegia occurs in half of the cases [7].

The diagnosis of GBS is confirmed by nerve conduction studies. The conduction abnormalities may be present even when the CSF protein concentration is normal [8]. Slowing of nerve conduction occurs after paralysis develops and may be more in the proximal parts of the nerve than distal. The electrophysiological abnormalities are maximum between 4 to 12 weeks after the onset of neurological symptoms. The outcome in untreated patients is unpredictable. Most patients undergo a gradual recovery but may be left with a few residual symptoms such as facial weakness, weakness of lower extremities with foot drop, weakness and atrophy of hands. About 10 to 15% of patients remain disabled [9]. Features associated with better outcome are younger age, no requirement for respiratory assistance, slower progression of disease and normal peripheral nerve function by electrodiagnostic criteria.

### Materials and Methods

All adult patients, diagnosed as Guillain-Barre’ Syndrome, who strictly complied with the NINCDS criteria, admitted to Christian Medical College and Hospital, Ludhiana from 1st July 1988 to June 30th 1993 were included in this study. This includes a retrospective study of four years and prospective study of one year. Ninety seven patients entered the study.

Data collection was done according to the proforma attached. In retrospective cases, the information was collected from the patient’s records. In the prospective group, a detailed history was taken, all patients were examined and then the data collected. All the patients underwent lumbar puncture on the day of admission and the cerebrospinal fluid was sent for the cell count, culture, protein content and sugar analysis. Each one of them had a complete haemogram and a urine examination. Urine was also examined for porphobilinogen. Serum electrolytes and serum calcium levels were estimated on admission to rule out hypokalemic paralysis and hypocalcemic states. Liver function tests and HBsAg and HIV tests were done on all the patients. A throat swab was taken in patients with sore throat to rule out diphtheria. An electrocardiogram was done to rule out

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hypokalemic changes, myocardial infraction and arrhythmia. A single breath count on admission was taken to assess the respiratory effort in these patients. Blood sugar was done to rule out diabetic neuropathy.

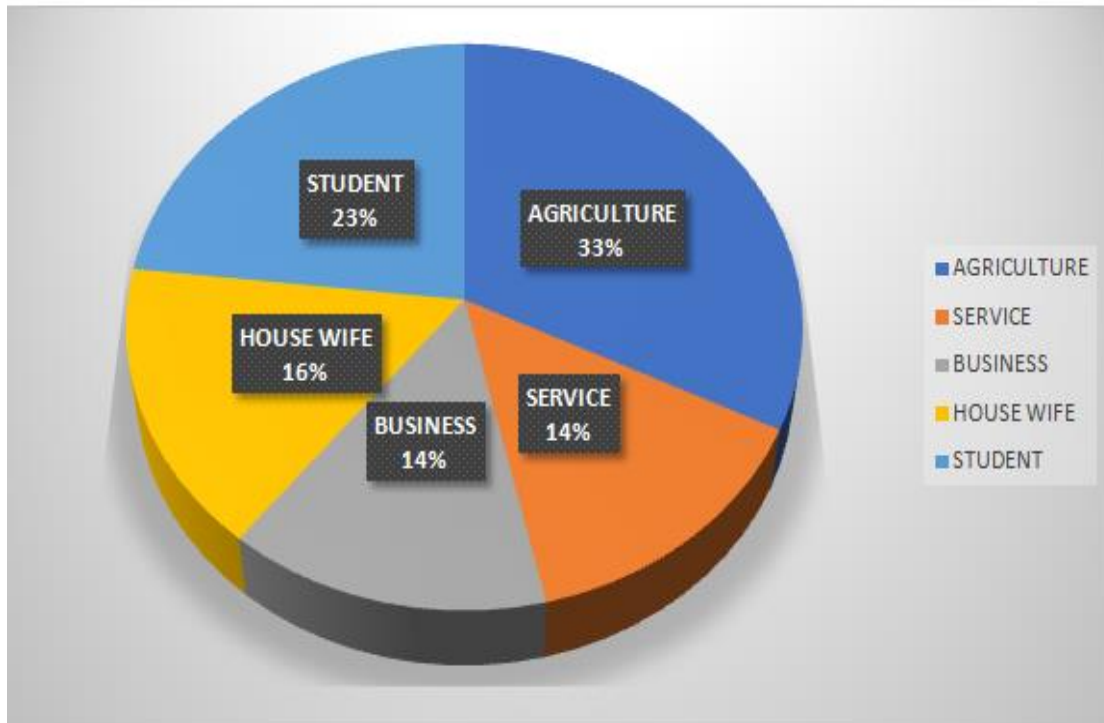
The patients were followed up regularly while in the hospital till discharge and the progress was noted. These patients were followed up regularly at the end of 3 months and 6 months and the progress was noted.

**Results**

**Table 1- Age and Gender wise distribution of Study participants**

Age Group (in years)	No. of Patients	Percentage	Male	Female
< 20	25	25.8%	21	4
21 – 30	23	23.7%	19	4
31 – 40	21	21.6%	18	3
41 – 50	17	17.5%	12	5
51 – 60	6	6.2%	5	1
>60	5	5.2%	3	2
TOTAL	97	100	78 (80.34%)	19 (19.65%)

As per table 1 the incidence of GBS was more in the younger group. 70% of our cases were below 40 years of age. 80.34% were males and 19.65% were females.



**Figure 1- Distribution according to Occupation**

As per figure 1 The agriculturists formed the maximum number of patients (32%) under study followed by students (22%) and house wives (16%). The incidence of GBS among agriculturists was significantly higher than the other groups except for students ( $p < 0.05$ ). Sixty percent of the patients were from the rural areas and 40% from the urban areas.

**Table 2 – Predisposing factors or illness preceding GBS**

Predisposing factors or preceding illness	Number of Patients	Percentage
Upper Respiratory Infection	56	72.8%
Diarrhoeal Diseases	8	10.4%
Surgery	2	2.6%
Vaccination	1	1.3%
Enteric fever	2	2.6%
Tuberculosis	2	2.6%
Hepatitis B	2	2.6%
Herpes Zoster	2	2.6%
Hodgkins lymphoma	1	1.3%
Myocardial infraction	1	1.3%
<b>No illness or predisposing factors</b>	<b>20</b>	<b>20.6%</b>

As per table 2 upper respiratory tract infection was present in the maximum number of patients (72.8%). 20.6% of patients did not give history of any predisposing illness. It is interesting to note that there was one patient who developed GBS after myocardial infraction.

**Table 3- Autonomic Dysfunction and Clinical Outcomes in patients with GBS and their Sex distribution**

Autonomic dysfunction	Outcome				
	No. of Patients (%)	Survived (%)	Expired (%)	Sex	
				Male	Female
Bradycardia	13 (13.8%)	1 (7.6%)	12 (92.4%)	11	2
Tachycardia	7 (7.2%)	7 (100%)	Nil	6	1
Hypertension & Tachycardia	17 (18%)	14 (82.6%)	3 (19.4%)	15	2
Hypertension	10 (10.3%)	9 (90%)	1 (10%)	6	4
Ventricular Tachycardia	4 (4.1%)	0	4 (100%)	3	1
Ventricular ectopic beats (>6/mt) multifocal	2 (2%)	1 (50%)	1 (50%)	2	0
No	44 (45.3%)	40 (91%)	4 (9%)	35	

As per table 3 dysautonomia was seen in 54.6% of patients. 13.4% had bladder involvement. 3% had bowel and bladder involvement. 45.3% of patients did not have dysautonomia in any form. Forty three (44.3%) patients had breathing difficulty. All of them needed ventilator support. 54 (55.7%) patients did not have breathing difficulty and never needed ventilator assistance. Pain was present early in the illness in 60 (61.8%) patients. Pain was in the form of severe muscular pain in lower limbs, girdle pain, pain in interscapular and nuchal region.

**Table 4- Results of electrophysiological Studies**

Type of neuropathy	No. of patients	Percentage
Demyelinating	38	79.80%
Mixed	5	10.50%
Axonal	4	8.40%

As per table 4 thirty eight (78.8%) of patients had demyelinating type, 5 (10.3%) patients had mixed type and 4 (8.4%) patients had axonal type of neuropathy.

**Table 5- Various Complications in GB patients**

Complications	No. of Patients	Percentage
Dysautonomia	53	54.6%
Ventilatory failure	43	44.3%
Urinary tract infection	7	7.2%
Acute Renal Failure	5	5.3%
Bed sore and sepsis	2	2.1%
Exposure Keratitis	2	2.1%
Tracheostomy infection	15	15.5%
Bronchopneumonia	14	14.3%
Upper G.I. Bleed	10	10.3%
Contracture	1	1%

As per table 5 Dysautonomia was present in 54.6%, ventilator failure in (44.29%) patients, urinary tract infection in 7.2%, Tracheostomy infection in 15.5%, Bronchopneumonia in 14.3%. Incidence of dysautonomia was significantly higher than any other complications ( $p < 0.01$ )

**Table 6- Outcome of Patients treated with or Without Prednisolone**

Patient group	No. of pts. (%)	Sex		No. of pts. Survived (%)	Expired (%)
		Male	Female		
Received Prednisolone	21 (21.6%)	16	5	17 (81%)	4 (19%)
Not received Prednisolone	76 (78.2%)	63	13	55 (72.4%)	21 (27.6%)

As per table 6 twenty one patients (21.6%) received prednisolone and 4 (19%) of the group expired. 76 patients (78.2%) did not receive prednisolone and 21 (27.6%) patients expired in this group. The difference in mortality in two groups were not found to be statistically significant ( $p 0.426$ ).

## Discussion

Total of 97 patients who strictly fulfilled the NINCDS criteria entered the study. The majority of the patients belonged to the younger age group (70%). The incidence seemed to be less as the age increased. The maximum number of patients were below 20 years (25 patients), slowly declining in 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> decades. This is an contrast to the study done by Halls et al who found that most of the patients were in older age group (more than 50 years) and the least number of patients were between 20 to 30 years of age[10]. Others also found an increase in the incidence of GBS with age as per Alter et al[11]. However, the study in North China by Wu et al, showed the incidence in young adults to be higher which was similar to the findings in our study[12]. Kennedy et al found no detectable change. In the present study males were affected more than the females[13]. There were 78 (80.34%) male patients and 19 (19.66%) female patients. The Olmsted country study and the study in Hordaland country showed an increase in incidence among the male patients as per Beghi et al[14]. DeJager and Sluiter in their study, also found the male sex to be more vulnerable to GBS. Among the patients studied, agriculturists (32%) were the more affected group followed by students (22.7%). Wu et al

from China reported a higher incidence of the disease in rural population[12]. However in India, majority of our population live in the rural areas and hence the higher incidence. In the presence study, 57 (74.1%) patients had respiratory tract infection. Others also have reported strong association between respiratory infection and GBS. The incidence of respiratory tract infection was found to be 40% by Kennedy et al and 39% by DeJager and Sluiter[5]. In the present study, 2 (2.6%) patients developed GBS following surgery. Both of them underwent cholecystectomy and they developed GBS 2 weeks after the surgery. McDonagh and Dawson described the association of GBS and acute myocardial infection[15]. One (1.3%) of our patients developed GBS on the fourth day of an acute extensive anterior myocardial infraction while in hospital. The patient developed breathing difficulty and numbness of extremities. Severe dysautonomia has been the cause of death in most of our patients. 53 (54.6%) patients had dysautonomia in our study as compared to 66 (66.7%) in the study by Bansal et al[16]. Incidence of dysautonomia was significantly higher than any other complications ( $p 0.01$ ). In the present study, bradycardia was found in 13 (13.8%) patients, tachycardia 7 (7.2%) patients, hypertension and tachycardia in 17

(18%) patients, hypertension in 10 (10.3%) patients, ventricular ectopic beats 2 (2.3%) patients. Dysautonomia was found mostly among the younger age groups (2nd to 4th decade). DeJager and Sluiter found hypertension in 79% of patients, tachycardia was seen in 74% of patients, bradycardia and cardiac arrest in 11% of patients as the part of dysautonomia. Halls et al found dysautonomia in 38% of patients[10]. In the present study, 13 (13.4%) patients had transient bladder involvement and 3 (3%) patients had both bladder and bowel involvement. 81 (83.5%) patients did not have neither bowel nor bladder involvement. Kennedy et al and Halls et al found bladder involvement in 25%, 9% and 11.7% of patients respectively. Urinary tract infection (UTI) was seen in 7 (7.2%) patients. 32% of patients had UTI in the study. Prednisolone was given at a dose of 1mg/kg body weight at random. In the study, there was not much of difference in the recovery or mortality of the patients who received and who did not receive prednisolone. The difference in mortality in the two groups was not statistically significant (p 0.426). Our study was consistent with the England trial, where they found that, glucocorticoids was not helpful to reduce the morbidity and mortality in patients[17].

#### Conclusion

Clinical, epidemiological and electrophysiological features of 97 patients diagnosed as GBS were studied over a period of 5 years. There were 78 (80.34%) male patients and 19 (19.66%) female patients. The peak incidence was in the 2<sup>nd</sup> and 3<sup>rd</sup> decades. The maximum number of GBS cases were seen from June to October (55%). The agriculturist were the most vulnerable group (32%) followed by students (22.7%) (p<0.05).

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