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Original research article

Electrophysiological, Autonomic and Pulmonary functions in Guillain Barre Syndrome - A comparative study

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Abstract

Introduction: Guillain–Barre syndrome (GBS) is one of the most frequent causes for acute flaccid limb weakness and also one of the most common causes of neuromuscular respiratory failure with an average incidence of 17%–30% patients requiring mechanical ventilation. This respiratory failure caused by GBS contributes to morbidity and mortality significantly, linked to even more worsening outcomes leading to poor long-term functional prognosis.

Materials and Methods: This is a prospective observational study conducted for a year from August 2018 to September 2019 at a tertiary care hospital, where clinical-laboratory assessment and nerve conduction studies were performed and analysed among the 64 consecutive patients attended and hospitalized with Guillain-Barre syndrome in our hospital.

Results: The present study happened from August 2018 to September 2019 among 64 GBS patients, out of which 38 were males and 26 females. Their ages ranged from 11 yrs. to 68 yrs., where the maximum number of patients i.e., 18 (28%) were between 21-30 years of age group.

Discussion: In this study, 42 (65.6%) were, < 40 years and 22 (34.4%) were aged > 40 years. Sex ratio showed a slight male preponderance in most of the studies. [7, 8] Preceding events prior to the illness in present study is observed in thirty-three patients (52%) had preceding illness, most of previous studies shows antecedent event in >50% patients.

Conclusion: Marked patterns of abnormalities in electrophysiological functions are observed in patients that are correlated with the period of mechanical ventilation. Autonomic dysfunctions are noticed among one third of the patients in this study, where the recovery rate is satisfactory.

Keywords: Autonomic function, Electrophysiological function, Guillain Barre Syndrome, Pulmonary function, Respiratory failure

Introduction

With an incidence of 0.6–1.5 per 1lakh population, Guillain–Barre syndrome (GBS) is one of the most frequent cause for acute flaccid limb weakness and also one of the most common causes of neuromuscular respiratory failure with an average incidence of 17%–30% patients requiring mechanical ventilation. This respiratory failure caused by GBS contributes to morbidity and mortality significantly, linked to even more worsening outcomes leading to poor long-term functional prognosis. [1] Electrophysiological studies are used for confirming the GBS diagnosis and also in distinguishing the GBS from other clinically similar diseases. The findings of the electrophysiological studies typically show evolving multifocal demyelination patterns in the form of decreased nerve conduction velocity, abnormal temporal dispersion, partial motor conduction block (CB) and prolonged distal latencies, prognosticating the recovery of the patient from GBS. [2] Essentially, assessing the electrophysiological functions has been used in the early identification of patients, who might eventually progress to respiratory failure. [3] As the electrophysiological studies significantly reflect the severity and nature of the underlying pathology in the peripheral nerves of GBS patients, they can provide some crucial information regarding the nature of abnormalities in the ventilated and severely morbid patients. [4, 5] GBS is connected to autonomic dysfunction among two-thirds of patients, which includes blood pressure fluctuations, vasomotor dysfunction, arrhythmias, and gastrointestinal (GI) motility dysregulation. Autonomic dysregulation precedes the neurological deficits in GBS patients, which must be identified early for hastening the diagnosis and management of GBS. If not discovered and managed timely, the autonomic dysfunction can be accompanied with significant morbidity and mortality. [6]

Hence, effective management and efficient monitoring of electrophysiological, autonomic and pulmonary function and pulmonary rehabilitation are essential for optimal treatment and recovery of patients.

Materials and Methods:

This is a prospective observational study conducted for a year from August 2018 to September 2019 at a tertiary care hospital, where clinical-laboratory assessment and nerve conduction studies were performed and analysed among the 64 consecutive patients attended and hospitalized with Guillain-Barre syndrome in our hospital. Written informed consent was taken from all the relatives of the participant and the Institutional Ethics Committee approved the study protocol. Male and female patients aged greater than 10 years, diagnosed with Guillain barre syndrome admitted into our hospital were included in this study. Pregnant and lactating women, patients with significant respiratory, cardiac, psychiatric and renal morbidity and terminal illnesses were excluded from the study. Detailed clinical history recording and examinations of each patient were done for all patients, where Medical Research Council (MRC) sum score is used for assessing the functional motor deficits. Routine investigations were done including Complete Blood Picture, peripheral smear examination, liver and renal function tests including Serum electrolytes. Specific investigations like CSF examination for albumino - cytological dissociation, nerve conduction velocity studies (NCV), The data acquired in the study were entered into Microsoft excel sheet and categorical variables were summarized as counts (percentages).

Results:

The present study happened from August 2018 to September 2019 among 64 GBS patients, out of which 38 were males and 26 females. Their ages ranged from 11 yrs. to 68 yrs., where the maximum number of patients i.e., 18 (28%) were between 21-30 years of age group (Figure 1). Most of the patients i.e., 36 (56%) had gastrointestinal abnormalities in the form

of loose motion and vomiting. Respiratory infections were observed among 26 (40%) patients (Figure 2). The most common clinical feature was observed quadriparesis in 60 (94%) patients. The least common clinical feature observed was paraparesis in four (6%) patients and Areflexia observed in all patients.

Autonomic dysfunction was observed in 22 (34.3%) patients in the form of tachycardia, hypertension, postural hypotension, fluctuation in pulse and BP in 12 and 21 patients respectively, sweating abnormality, GI dysfunction and pupillary abnormalities respectively. Out of 64 patients, 28 (44%) had respiratory paralysis during the course of illness. Out of 28 patients, 24 of them required respiratory support within one week of onset of weakness while six patients required ventilatory support within 1-2 weeks of onset of weakness. CSF abnormalities in the form of Albuminocytologic dissociation observed in 44 (69%) patients and nerve conduction studies were abnormal in 64 patients (100%). Out of 64 patients, 58 (90%) patients had absent / delayed f-wave latencies and slowing of conduction velocity, which was the most common abnormality observed. Majority of the patients 59 (92%) received treatment in the form of plasmapheresis, while 5 (8%) patients received IVIg. Duration of mechanical ventilation in majority patients 14(42%) was less than 10 days, around 16(48%) patients required mechanical ventilation for 10-30 days and around 3(10%) patients required mechanical ventilation for more than a month. Respiratory complications were observed in majority 28(44%) patients, while cardiovascular complications in 18 (28%) patients, metabolic complications in 19(30%) patients, nutritional complications in 24(38%) patients and hematologic complication in form of DVT was seen in 1 patient. Majority of the patients 52 (81%) were recovered completely after treatment, while 8 patients (13%) died and incomplete recovery was observed in 4 patients (6%).

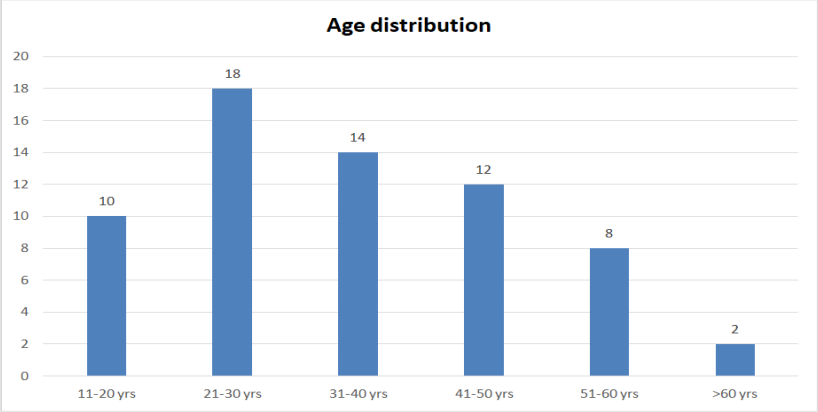

Fig. 1: showing age distribution of the 64 GBS patients considered in this study

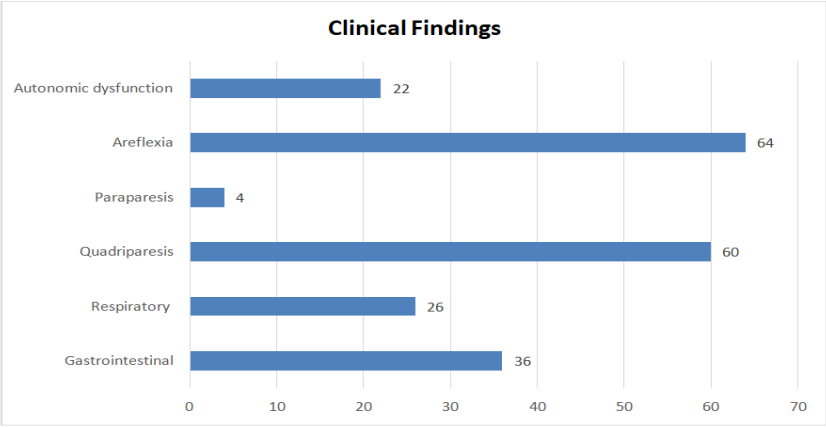

Fig. 2: showing Clinical findings of the 64 GBS patients considered in this study

Discussion:

The study gathered information from 64 GBS patients who were > 10 years of age, admitted to a tertiary care hospital. In this study, 42 (65.6%) were, < 40 years and 22 (34.4%) were aged > 40 years. Sex ratio showed a slight male preponderance in most of the studies. [7, 8] Preceding events prior to the illness in present study is observed in thirty-three patients (52%) had preceding illness, most of previous studies shows antecedent event in >50% patients. [9, 10] Majority of the patients >95% in all studies have shown limb weakness, which is in accordance with previous studies. As compared to other studies, in present study there were a greater number of patients with autonomic dysfunction (34%) and respiratory distress (44%). [11, 12] Chirag et al observed albuminocytologic dissociation in about 50% patients while in our study it was around 69%. [13] In our study, majority (>90%) patients were treated with Plasmapheresis while in majority of the previous studies (>90%) patients with GBS treated with IVIg. [14, 15] In our study, complete recovery was observed in about 81% patients while in other studies (>70%) patients with GBS were recovered completely.

Conclusion:

Nerve Conduction studies are the most useful and reliable investigations to diagnose the abnormalities in all GBS patients. Marked patterns of abnormalities in electrophysiological functions are observed in patients that are correlated with the period of mechanical ventilation. Autonomic dysfunctions are noticed among one third of the patients in this study, where the recovery rate is satisfactory.

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