

# PLASMA EXCHANGE IN PATIENTS WITH THE DIAGNOSIS OF GUILLAIN-BARRE SYNDROME: AN EXPERIENCE IN INTENSIVE CARE UNIT

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## ABSTRACT

**Objective:** To assess the effectiveness of plasma exchange in patients with Guillain-Barre syndrome.

**Methodology:** This descriptive study was conducted at Intensive Care Unit Lady Reading Hospital Peshawar from March 2008 to July 2010. Twenty eight patients were included in study after fulfilling inclusion criteria. All the diagnosed cases of Guillain-Barre syndrome were admitted in Intensive care Unit Post Graduate Medical Institute Lady Reading Hospital Peshawar and 4 sessions of plasma Exchange therapy was initiated in every patient after informed written consent.

**Results:** Out of 28 patients 19 were male (67.85%) and 9 were female (32.14%). Mean age was 32.32 years and mean duration of stay in Intensive Care Unit was 6.32 days. Out of these 28 patients, 60.71% (17) recovered and 39.3% (11) expired despite treatment and 2 patients developed adverse events secondary to Plasma Exchange. In 25 (89.29%) patients breathlessness was reported as their major symptom beside motor weakness, while in 19 (67.85%) patients, pain was also reported.

**Conclusion:** Early referral to Intensive Care Unit, management of complications, good nursing care and specific therapy with Plasma Exchange within seven days of onset of symptoms improve prognosis and Plasma Exchange has proved beneficial to supportive treatment alone in Guillain-Barre syndrome with minimal side effects.

**Keywords:** Guillain-Barre syndrome; Plasma Exchange; Cerebrospinal Fluid Analysis; Nerve Conduction Studies.

## INTRODUCTION

Guillain-Barre Syndrome (GBS) is an acute onset, monophasic, immune-mediated polyneuropathy that often follows an antecedent infection<sup>1, 2</sup>. The Diagnosis relies heavily on the clinical impression obtained from the history and examination, although cerebrospinal fluid analysis and electrodiagnostic testing usually provide evidence supportive of the diagnosis. Prolonged compound muscle action potential duration (>8.5msec) on distal stimulation may suggest distal demyelination and can be helpful in some cases<sup>3</sup>.

GBS is equally common in men and women and can occur at any age<sup>4</sup>. The reported incidence rates for GBS are 1 to 2 per 100,000

population<sup>5</sup>. The lifetime likelihood of any individual acquiring GBS is 1:1000<sup>6</sup>. Onset of motor weakness is abrupt and is often preceded a few weeks by an upper respiratory or other infection<sup>7</sup>. Approximately 80 to 90% of patients with GBS become non-ambulatory during the illness. Pain is prominent in 50% of patients<sup>8</sup>. Other regional variants of GBS are those that affect other specific areas of the body, such as only the face or the afferent sensory and autonomic systems<sup>9</sup>.

In the 1980s, plasma exchange (PE) was found to be an effective treatment<sup>10</sup> and in 1990s, efficacy was also demonstrated for intravenous immunoglobulin (IVIg). In the Acute GBS,

treatment with IVIg is at least as effective as plasma exchange and may be superior<sup>11</sup>. The value of plasma exchange in children less than 12 years old is not known. Plasma exchange (PE) is more beneficial when started within seven days after disease onset rather than later, but was found to be beneficial in patients treated up to 30 days after disease onset<sup>12</sup>.

The Decision to use PE or IVIg must be based on multiple factors, including availability of treatments and the side effects profiles in the context of the patient's course and comorbidities<sup>13</sup>. Corticosteroid treatment is ineffective for treating GBS<sup>14</sup>. Approximately one third of hospitalized GBS patients require mechanical ventilation because of respiratory muscle or oropharyngeal weakness<sup>15</sup>. Persistent disability is seen in 20 to 30% of adult GBS patients, but is much less common in children<sup>16</sup>. Fatigue in patients who suffered GBS is significantly associated with reduced quality of life and is independent of muscle strength, sensory impairment, functional ability, and electrophysiological findings<sup>17</sup>. In a randomized, controlled trial of amantadine for severe fatigue following GBS, amantadine was not superior to placebo<sup>18</sup>. There is either no or very minimal risk of GBS associated with routine immunization<sup>19</sup>. Supportive care in GBS patients is of greater value and it also decreases the morbidity and mortality of patients<sup>20</sup>.

Majority of our population is poor socio-economically and thus are unable to afford IVIg, which is very expensive treatment option as compared to PE. The study is focused on the notion that treatment of GBS patients should not be delayed and shifted to ICU for proper management to decrease the morbidity and mortality with this condition. The management of the patients with severe and protracted GBS provides a major challenge, as the prognosis is generally excellent if complications can be treated early or avoided. These complications may be life threatening, affect any of the major organs, systems, or result in permanent disability and even death and can be prevented only by early diagnosis and intensive management<sup>21</sup>. In this context, this study was planned with the objective of assessing the effectiveness of plasma exchange in patients with Guillain-Barre syndrome.

## METHODOLOGY

This was a descriptive study conducted at General Intensive Care Unit (ICU) of Post Graduate Medical Institute Lady Reading Hospital Peshawar from March 2008 to July 2010. All

admitted patients in ICU of the Hospital with the diagnosis of GBS and who had not received any other specific treatment option for GBS beside Supportive therapy were included in the study. A minimum of four sessions of Plasma Exchange was considered as the main stay of treatment. All those patients with GBS, who were not willing for plasma exchange therapy and those with any other coexisting central nervous system disorder, were excluded in the study.

Informed consent was taken from all the patients included in the study. Detailed history of the patient was taken and was assessed clinically. Nerve conduction Studies and Cerebrospinal Fluid Analysis were also done in every patient and neurologist opinion in every patient was taken. General intensive care unit is all the time in liaison with various units of Lady Reading Hospital Peshawar, and is admitting and managing those patients who are already admitted in various unit of Post Graduate Medical Institute Lady Reading Hospital Peshawar. Data was analyzed using SPSS v.16.

## RESULTS

A total of 28 patients were included in the study. Out of these 28 patients 19 were male which makes 67.85% of all patients and 9 were female which makes 32.14% of the patients admitted in ICU.

The patients received Plasma Exchange beside supportive therapy. Mean age was 32.32 years, with minimum of 11 and maximum of 90 years. Their Mean duration of stay in ICU was 6.321 days, with minimum 1 day and maximum 14 days.

Breathlessness was reported in 25 patients which makes 89.29% of all patients in the study and Pain was reported in 19 patients which make 67.85% of the sample size. Among drugs used for the relief of pain, Gabapentin, carbamazepine, tramadol and tricyclics were proven effective for the relief of pain in patients with Guillain-Barre syndrome by subjective assessment of pain by using Visual Analog Pain Scale.

Outcome criteria were either recovered patients (Those shifted back to their respective Units after receiving Plasma Exchange therapy and not needing any additional care in ICU) or expired in ICU after receiving Plasma Exchange therapy. Seventeen patients successfully recovered which makes 60.71% of all patients and 11 expired which makes 39.3% of all patients. Out of these 11 expired patients 8 were male and 3 were female. Majority of these expired patients were above 50

years of age and they had other coexisting diseases as well.

Two patients had developed side effects of Plasma Exchange. One patient developed Septicemia and the other had pneumonia due to Plasma Exchange, which were managed successfully. All 28 patients needed Mechanical Ventilator for some time for ventilatory failure.

## DISCUSSION

Plasma Exchange is a well established therapeutic procedure commonly used in many Neuroimmunological Disorders<sup>22</sup>. In Guillain-Barre syndrome therapeutic efficacy of plasma exchange has been demonstrated. The results of our study are in line with the study done by Helmar C et al<sup>22</sup>.

In a study done by Valbonesi M et al<sup>23</sup>, the success rate of plasma exchange is 100% which is much better than our results but in this international study plasma exchange was evaluated in only six patients with Acute GBS and in one with its chronic relapsing type.

The results of this study is also comparable to the local study done by Firdous R et al<sup>24</sup>, which clearly indicates that early referral to ICU, management of complications, good nursing care and specific therapy with Plasma Exchange within seven days of the onset of symptoms improve prognosis. The delay referral of the patients from the medical wards to the ICU also affected the mortality rate. Most of the patients were referred only when they went into severe respiratory distress<sup>25</sup>. Respiratory infection already contracted in medical wards contributed to higher mortality of 19.04% in those patients who were on ventilator<sup>21</sup>.

Significant adverse events are associated with PE in patients with GBS<sup>13</sup>. But in our study only two patients have developed complications, one has developed septicemia which was successfully controlled and treated with empirical antibiotic therapy and one patient have developed pneumonia which was also managed effectively with Moxifloxacin infusions. All children have received PE in this study have been recovered without any complications.

The most common pain types in patients with GBS are deep, aching back and lower extremity pain and dysesthetic extremity pain. In our study pain was reported in almost 68% of patients, which is more than the study done by Moulin DE et al<sup>26</sup>. This may be because of relatively small sample size.

To achieve a reasonable degree of certainty about the diagnosis of GBS, the

neurologist must consider the mimics because vasculitic neuropathy may also resemble GBS<sup>27</sup>. For this purpose we have done the consultation with neurologist as well to exclude the vasculitic neuropathy.

Beside neuromuscular respiratory failure requiring mechanical ventilation, time from onset to admission of less than one week, facial weakness, inability to cough, inability to lift head off of pillow, and atelectasis on chest radiographs are other factor associated with respiratory failure and need for mechanical ventilation<sup>28</sup>. In our study all patients needed mechanical ventilation in different stages because most patients admitted to ICU is for mechanical ventilation facility that is only available in ICU.

90% patients experience most of the recovery during first year, especially the first 6 months but the majority of patients continue to experience recovery well into the second year and often beyond<sup>29</sup>. We, however, did not note any such experience in this study because ICU patients are directly admitted from various units and we shift them to their respective units after recovery. Therefore we have not seen these patients in their follow up examination in Hospital.

Most patients were male, this was also because of the small sample size in our study otherwise there is equal distribution of GBS in both sex<sup>11</sup>. Severe Fatigue is a sequela of GBS in approximately two thirds of adult patients<sup>30</sup>. It can persist for years and is considered by most patients to be one the most disabling residual symptom<sup>17</sup>.

## CONCLUSION

Early referral to Intensive Care Unit, management of complications, good nursing care and specific therapy with Plasma Exchange within seven days of onset of symptoms improve prognosis and Plasma Exchange has proved beneficial to supportive treatment alone in Guillain-Barre syndrome with minimal side effects. Male were affected more than females but the treatment response is same in both sex.

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