

Original Research Article

Therapeutic plasma exchange in Gullian Barre Syndrome: an experience of our centre

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ABSTRACT

Background: Therapeutic plasma exchange (TPE) has been used for the treatment of neurological diseases in which autoimmunity plays a major role. Although, there are several modes of plasmapheresis applicable to Gullian Barre Syndrome (GBS) but no definite guidelines for selecting an optimum mode have been established so far. The aim of the study was to analyze the clinical benefits of plasma exchange (PE) on the patients of GBS and compare the cost effectiveness of TPE over other modalities.

Methods: Records of 36 patients who received TPE between March 2015 to September 2015 were analysed using continuous flow cell separator CS-3000. All the patients had undergone minimum 2 cycles of PE. One plasma volume was exchanged for each cycle.

Results: Out of 36 patients, there were 28 (77.78%) male and 8 (22.22%) females. The mean age of patient was 28.23 ± 1.23 years which range from 12 to 36 years. After TPE on 36 patients, 28 (77.78%) patients clinically improved after first cycle of PE and 5 (13.89%) patients improved after second cycle. Patients who received 4 and 3 cycle of PE experience no complications and >75% and 55-60% patients showed improvement respectively.

Conclusions: The treatment is cost effective in comparison to the available IV immunoglobulins. TPE is an easy and effective treatment in GBS.

Keywords: Gullian barre syndrome, Immunoglobulins, TPE

INTRODUCTION

Gullian barre syndrome (GBS) is sub-acute inflammatory demyelinating polyneuropathy leading to severe qudruparesis and respiratory failure which require ventilation to be done. Records have shown that around 20% of such patients required ventilation.^{1,2}

Though pathogenesis of GBS is unknown but different reports have shown the involvement of immune system. Preceding infections with campylobacter jejunii is the main reason for GBS which may be due to molecular

mimicry between the epitopes on the infectious agents and peripheral nerve constituents.¹⁻⁵

Direct treatment for GBS is lacking. Alternatively, treatment that supports the patient with the disabilities caused by the disease is mainly used. The progress of paralysis must be carefully monitored, in order to provide mechanical assistance for breathing if it becomes necessary. Careful attention must also be paid to the amount of fluid the patient is taking in by drinking and eliminating by urinating. Blood pressure, heart rate and heart rhythm also must be monitored.⁴

Plasma exchange (PE) is performed early in the course of GBS, has been shown to shorten the course and severity of GBS. PE comprises of withdrawing the patient's blood, passing it through an instrument which separates the different types of blood cells, and returning all the cellular components (red and white blood cells and platelets) along with either donor plasma or a manufactured replacement solution. This is thought to rid the blood of the substances that are attacking the patient's myelin.⁶

It has also been shown that the use of high doses of immunoglobulin given intravenously may be just as helpful as plasmapheresis. It is interesting to note that corticosteroid medication (such as prednisone), often the mainstay of anti-autoimmune disease treatment, are not only unhelpful, but may in fact be harmful to patients with GBS.⁷

The present study was performed to analyze the clinical benefits of PE on the patients of GBS and compare the cost effectiveness of TPE over other modalities.

METHODS

TPE in 36 GBS patients having age between 12-36 years was performed in Lifeworth Hospital, Raipur, India during March 2015 to September 2015. CS-3000 (fenwal) continuous flow cell separator was used to separate different component of patient's blood.

Patients presented with quadriparesis, difficulty in breathing and no bowel, bladder or any sensory involvement were included in the present study and all were immediately undergone PE procedure.

At each procedure, 1-1.5 plasma volume exchange was given and FFP in combination with sterile saline or Albumin was given as replacement fluid. Two cycles were done for all the patients, 10 patients received 3 cycles and 3 patients received 4 cycles.

A femoral catheter was inserted in all the patients before procedure. Blood pressure, heart rate and heart rhythm were monitored by the clinical residents during the procedure.

RESULTS

In present study, out of 36 patients, there were 28 (77.78%) male and 8 (22.22%) females. The mean age of patient was 28.23±1.23 years which range from 12 to 36 years.

After TEP on 36 patients, 28 (77.78%) patients clinically improved after first cycle of PE and 5 (13.89%) patients improved after second cycle. Patient improvement was associated with a drop in antibody titer as a result of PE.

Table 1: Complications and clinical improvement using different cycles.

No of Cycle	N	Complications during procedure	Clinical improvement (%)*
1	20	None	>40
	8	None	<30
	7	Oral tingling (n=2) Abdominal pain (n=1)	<10
2	20	Hypotension (n=1), Dizziness (n=2), Oral tingling (n=1)	>85
	8	Hypotension (n=1)	>60
	5	Vomiting (n=1) after procedure	>30
	2	Oral tingling (n=1)	<10
3	10	None	>80
	5	None	55-60
4	5	None	>75

* breathing difficulty and paresis, N; no of patients

Complications such as nausea, vomiting, hypotension, dizziness and perioral tingling (hypocalcemia) and abdominal pain was recorded during procedure. No fatal complication was observed during procedure. As a treatment oral calcium for tingling, fluids for hypotension and intravenous calcium for abdominal pain was given.

DISCUSSION

Patient improvement is associated with a drop in antibody titers as a result of PE. The pathogenic antibodies are not identified or, if identified, have not been measured in a rigorous fashion.^{3,8}

PE can be looked upon as a "blunderbuss" that removes all the nonformed elements in plasma, including immunoglobulins, cytokines, and other serum factors, in a nonspecific fashion.⁹ The specific factor whose removal is crucial in therapeutically successful PE is thus not specifically known. There is not much data available of the plasmapheresis effect on different disease.¹⁰⁻¹²

Our results for PE were comparable to other studies for GBS, 2 cycles of PE are more beneficial than 1 cycle. PE is more beneficial when started within seven days after disease onset rather than later, but was still beneficial in patients treated up to 30 days after disease onset. Valbonesi et al performed a similar study on 6 patients with acute GBS.¹³ Valbonesi et al reported that following PE all the patients showed improvement in motor strength in their ventilatory function and in their sensory symptoms. Before therapy, all the patients were found to have high levels of immune complexes; which was reduced by PE which is in accordance with the present study data.¹³ Similar reports were shown by Greenwood et al.¹⁴

PE is more beneficial when started within seven days after disease onset rather than later, but was still beneficial in patients treated up to 30 days after disease onset. Rail et al in their short communication reported that an old woman of 37 year of age with GBS was treated with PE on 3rd day of diagnosis and shown a marked improvement in motor conduction. The possible reason for this may be due to removal of complement-dependent myelinotoxic antibodies.¹⁵ The data given by Rail et al is consistence with the present study. Study done by Burns also advocated the importance of not delaying the treatment of patients with GBS because of an inappropriately wide evaluation for less common mimics.⁴ Similar results were reported by Van der Meche FGA in his review.⁷

One cycle of PE with FFP as replacement fluid costs around 8500 rupees. With albumin and other replacement fluids it is costlier but still cheaper in comparison to the immunoglobulins (total cost of treatment around 4 lacs rupees). Tharakan et al in his review also reported the cost effectiveness of PE in intensive care unit and hospital expenditure.⁶

The present study has few limitation of being less in sample size; a large clinical trial is recommended to confirm the present study findings.

CONCLUSION

PE is an ideal option for treatment of GBS in Indian setups. We found PE as a good treatment for the patients of GBS with negligible complications and cost effectiveness.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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