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A CASE REPORT ON STEROID THERAPY V/S IVIg THERAPY IN TRANSVERSE MYELITIS

***[1]Breezy Ani Sam, [2]Elisaba Jacob, [3]Nayana Rachel Koshy and [4]Dr. Anilkumar Sivan**

[1,2,3]Pharm D. Intern, Nazareth College of Pharmacy Othera.

[4]Senior Consultant, Department of Neurology, Believers Church Medical College Hospital, Thiruvalla.

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***Corresponding Author**
Breezy Ani Sam
Pharm D. Intern, Nazareth College of Pharmacy Othera.

ABSTRACT

Background: Transverse myelitis (TM) is a rare inflammatory disease that damages the spinal cord, resulting in various degrees of weakness, altered sensory perception, and autonomic dysfunction. Standard care includes intravenous methylprednisolone or dexamethasone for 3 to 5 days but treatment with intravenous immunoglobulins (IVIg) and plasma exchange (PLEX) have been successful.[1] **Materials and Method:** This is a case study of 51 year old female patient who was diagnosed with Transverse Myelitis and hence we provided with both Steroid therapy and IVIg therapy. **Result:** In this case report we are comparing the effectiveness of standard steroid therapy and the IVIg therapy and hence found that IVIg is more effective and potent to treat TM than steroid therapy. **Conclusion:** The patient showed symptomatic relief while using IVIg compared to Steroid therapy.

KEYWORDS: Transverse myelitis, Intravenous methylprednisolone, Intravenous immunoglobulins, Plasma exchange.

INTRODUCTION

Transverse myelitis (TM) is a condition characterized by sensory, motor, or autonomic dysfunction in the spinal cord can result from infections or inflammatory causes. It is diagnosed through clinical and radiological findings, often indicating inflammation. MRI is used to assess if there is a compressive or inflammatory lesion or a spinal cord stroke. Lumbar puncture is used to look for inflammation markers in the Cerebrospinal fluid (CSF) such as elevated CSF white cell counts, protein, and IgG index. If no clear cause can be

identified, the diagnosis is idiopathic TM. Within idiopathic TM, it is useful to distinguish between acute partial TM, acute complete TM, and longitudinally extensive TM (LETM).[9]

Early treatment is crucial for rare neuroimmune diagnoses, as it helps quiet down the immune system before damage is done. Common acute therapies include high-dose steroids, plasmapheresis, immunoglobulin therapy, and cyclophosphamide. Intravenous steroid treatment is the primary treatment for acute TM, with corticosteroids having anti-inflammatory, immunosuppressive, and anti-proliferative properties. Standard care includes intravenous methylprednisolone or dexamethasone for 3 to 5 days but treatment with intravenous immunoglobulins (IVIg) and plasma exchange (PLEX) have been successful. PLEX is used to treat autoimmune CNS diseases by removing specific or nonspecific soluble factors that mediate or contribute to inflammatory-mediated organ damage.

Immunoglobulins, or antibodies, are produced by plasma cells in response to antigenic stimuli. IgG is the most abundant, accounting for 75% to 80% of immunoglobulins. Intravenous immunoglobulin (IVIg) is a concentrate of pooled immunoglobulins from healthy donors, crucial for humoral adaptive immunity. IVIg products, specifically IgG and IgA, are enriched from donor plasma using the Cohn-Oncley procedure. IgG makes up over 90% of proteins in an IVIg preparation, providing protection against diverse diseases. IVIg therapy aims to replenish IgG antibodies that passively neutralizing or opsonizing pathogens. IVIg is classified into several broad categories based on its mechanism of action and the conditions it treats.

1. As a replacement therapy in immunodeficiencies.
2. For immunomodulatory and anti-inflammatory therapy
3. As a hyperimmune therapy against specific infectious agents.

Intravenous immunoglobulin (IVIg) is a treatment that uses plasma-donated immunoglobulins to treat inflammatory conditions and increase immunoglobulin levels. The frequency of IVIg infusions depends on the condition and response to the treatment, with the dose calculated based on weight. IVIg doses are based on the medical condition, with low-dose immunoglobulins serving as passive replacements in immunodeficiencies (category I only), and high-dose immunoglobulins actively modulating immune functions with additional anti-inflammatory activity (category II only). Category III hyperimmune therapy, which is specific antibodies, does not fall under the scope of dose-differentiation.[2][8]

IVIg is well-tolerated and can cause potential adverse reactions, such as headache, nausea, muscle pain, fever, chills, chest discomfort, skin and anaphylactic reactions. However, there is no data confirming the value of IVIg in acute events.[12]

Some of the diseases that intravenous immunoglobulin (IVIg) can treat include.

- Immune thrombocytopenia (ITP)
- Guillain-Barre syndrome (GBS)
- Chronic inflammatory demyelinating polyneuropathy
- Neurological diseases like myasthenia gravis or multiple sclerosis.[3][4][10][11]

This study aims to determine if early treatment with IVIg in addition to standard steroid therapy is more beneficial for adults with TM compared to current standard therapy alone.[1]

CASE REPORT

A 51 year old female patient who has a past history of Type II DM, Dyslipidemia and is on medication for 20 years, went to a local hospital with complaints of difficulty in walking since early in the morning and acute onset of difficulty in bearing weight in the left lower limb and she also developed abdominal pain in the left upper quadrant which was slowly progressive, as the pain aggravated and the weakness progressed patient was referred to Believers Church Medical College for further management.

On physical examination blood pressure, pulse rate, respiratory rate and SpO2 were seen to be in the normal range and EOM was full and speech was normal and on further examination left and right lower limbs showed power to be 4/5 and 5/5 respectively. And for sensory examination left-sided dorsiflexion was found to be weak. Hence an MRI brain stroke protocol was done, which revealed No evidence of acute infarct, hemorrhage or space occupying mass lesions.

And an MRI whole spine screening and MRI dorsal spine with contrast was also done and was suggestive of Mild spondylosis, loss of cervical lordosis. Mild disc bulges abutting thecal sac at C5-C6 and C6-C7 levels. Mild spondylosis changes in dorsal spine. Mild disc bulges abutting thecal sac at D7-D8, D8-D9, D9-D10 levels, Lumbar spondylosis, Tiny Schmorls nodes in L1, L2 vertebral bodies, Mild grade I anterolisthesis of L5 over S1, Multilevel disc desiccation changes, Diffuse disc bulges along with facet degenerative changes causing thecal sac indentation and lateral recess narrowing with abutment of traversing nerve roots at L3-L4 and L4-L5 levels, Poorly defined subtle T2 hyperintensity within the posterior aspect

of the dorsal cord extending from D4 to D6 levels – suggestive of Demyelination. Lumbar puncture was done to study the CSF to rule out any infective etiology which revealed protein (40.20), ADA (4.60), glucose (148), and **cytological examinations of CSF came as positive for transverse myelitis.** OS-Neuromyelitits optica spectrum disorders (NMOSD), CSF came as negative. HRCT chest was done and which had ruled out the possibility of sarcoidosis. Pulmonology opinion taken with HRCT report.

As per the history and clinical examination findings patient was admitted to ICU i/v/o probable Transverse myelitis and hence injection methylprednisolone was 1gm in 500ml over 6 hours was started for 5 days and after evaluation patient was then planned for IVIG, and the IVIG therapy was started and a 5 day course of IVIG therapy completed which was given after giving a course of premedication that included a hydrocortisone, paracetamol, and pheniramine. Serum electrolytes were being monitored continuously.

2D ECHO done which showed Normal LV systolic function (LVEF: 79%) and cardiology consultation was sought with ECHO reports and the evaluation were normal. She was on antihypertensive and oral hypoglycemic along with insulin to keep the blood sugar level under control and was also on Pregabalin and thiamine along with multivitamins that was given.

DISCUSSION

Transverse myelitis (TM) weakens the spinal cord, causing autonomic dysfunction, sensory impairment, and paralysis. Treatment involves intravenous steroid therapy, immunoglobulins (IVIG), and plasma exchange.

In our patient the standard treatment provided is either IVIg or plasma exchange, but the patient has selected IVIg therapy. She was given with steroid pulse therapy (INJ.METHYLPREDNISOLONE 1g in 500 ml NS) for 5 days which did not shows any improvement and then given with 5days of IVIg therapy according to the patient body weight after which her condition had become improved. Patient was given with test dose of 10g IVIG infusion on first day and monitored for any effects after which she was given with 30g IVIG infusion for the next days to complete the 5 day course of IVIG. Our patient showed significant improvement with the given IVIG therapy and was hence was advised to perform physiotherapy sessions.

Our case report was similar to the case report done by ***E Pavlou*** *et al on the topic "Idiopathic acute transverse myelitis: Complete recovery after intravenous immunoglobulin"* which showed that IVIg therapy was more effective than steroid pulse therapy.[5]

Another case report done by *Yehuda Shoenfeld et al on the topic "IVIg therapy in autoimmunity and related disorders: our experience with a large cohort of patients"* suggests that in the presence of a steroid and immunosuppressive-resistant autoimmune disease, IVIg is a rational and safe choice.[6]

Another case report where Guidelines for the use of IVIg was suggested written by *Tom Feasby et al on the topic "Guidelines on the Use of Intravenous Immune Globulin for Neurologic Conditions"* which suggests IVIG use was recommended in Inflammatory demyelinating Polyneuropathy condition.[7]

DOSING

A total dose of 2g/kg over 5 days

Calculation: Body weight * 2g =Total dose for 5 days

In our patient,

Patient weight = 75 kg

Total dose =75kg*2g= 150g

CONCLUSION

Transverse myelitis (TM) weakens the spinal cord, causing autonomic dysfunction, sensory impairment, and paralysis. Treatment involves intravenous steroid therapy, including corticosteroids, immunoglobulins (IVIg) and plasma exchange. This study is to assess the benefits of early treatment with IVIg in addition to regular steroid therapy vs. current standard therapy alone for people with TM. Antibody administration by IVIg is an additional treatment option for acute inflammation. This is a case study of a 51-year-old female patient who had normal treatment after being diagnosed with transverse myelitis. We evaluated the efficacy of IVIg therapy to normal steroid therapy in this case report, and the results showed that IVIg is more potent and effective than steroid therapy in treating TM. The patient showed symptomatic relief and was advised to follow strict medication adherence and active physiotherapy.

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CONFLICT OF INTEREST

The authors declare that the case report was conducted in the absence of any commercial financial relationships that could be constructed as a potential conflict of interest.

ABBREVIATIONS

TM: Transverse myelitis

IVIg: Intravenous immunoglobulins

PLEX: plasma exchange

LETM: longitudinally extensive TM

CSF: Cerebrospinal fluid

NMOSD: Neuromyelitits optica spectrum disorders

HRCT: High-resolution computed tomography

ITP: Immune thrombocytopenia

GBS: Guillain-Barre syndrome

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