

# Plasmapheresis As An Adjuvant Treatment Modality In Toxic Epidermal Necrolysis: A Case Report

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## ABSTRACT

Toxic Epidermal Necrolysis (TEN) is an idiosyncratic reaction to some drugs, which is rarely seen in the paediatric population. Although plasmapheresis has been used in the management of such cases, as seen in various case reports, no standard guide-

lines have been established till date. We report here, an 8yr old boy who presented to us with severe TEN, who was successfully treated with plasmapheresis as a primary modality of treatment.

**Key Words:** Toxic epidermal necrolysis, Plasmapheresis

## INTRODUCTION

Toxic Epidermal Necrolysis (TEN) is a potentially life threatening disorder which is caused due to an idiosyncratic reaction to some drugs. The pathogenesis of TEN is still unknown and the standard therapy for TEN has not yet been established. Although plasmapheresis [1-7] has been hypothesized to help these patients by eliminating the inflammatory mediators and the cytokines, no controlled prospective studies or generally accepted guidelines exist for the treatment of this not easily predictable disorder. We present here, a case of TEN which improved dramatically after starting plasmapheresis as a primary modality of treatment.

## CASE REPORT

An 8yr old boy, a known case of Rolandic epilepsy, presented to us on the 7th day of illness, with diffuse skin lesions and severely deranged vitals. The child was on Lamotrigine, three days before the onset of the symptoms. The boy had bullous lesions involving more than 90% of the skin, with a positive nikolsky sign. The child was admitted to the PICU and was stabilized by fluid boluses and inotropic support. A central line (IJV) was inserted under aseptic precautions and it was used for monitoring CVP and for infusing fluids. An arterial line was used for invasive blood pressure monitoring. The offending drug, Lamotrigine was stopped. Plasmapheresis was done on a daily basis for 4 days by using fresh frozen plasma. The child showed remarkable improvement after two courses of plasmapheresis. Serum electrolytes, serum albumin, and haemoglobin with platelets were monitored during the course of plasmapheresis. The child showed remarkable improvement by the fifth day of the hospital stay. The feeds were started early and the child was discharged by the tenth day.

## DISCUSSION

In 1956, Lyell reported four cases with acute rash, followed by skin detachment and mucous membrane involvement [8]. The estimated annual incidence of TEN is reported to be between 0.4 and 1.3 cases per million per year, and it can occur in all the age groups. The reported mortality varies from 30% to 50%, with the primary cause of death being infection and multi-organ dysfunction. In the aetiology of TEN, 70% - 80% drug usage is determined [9]. It was so in the index case where the child developed the rashes on the 4th day after Lamotrigine (LTG) was added along with Valproate (VPA). The possible mechanism could be altered drug metabolism resulting in reactions which are mediated by toxic intermediate metabolites.

The SCORTEN (severity-of-illness score for TEN) is a validated model of disease severity which has been shown to accurately predict the mortality caused by TEN, based on a seven point checklist

[10]. In the index case, the SCORTEN score was 4/7, which predicted a mortality of 62.2%.

Plasmapheresis has been reported from several studies to be effective in the treatment of patients with TENS [1],[2],[3],[4],[5],[6],[7] [Table/Fig 1].

SL. No	Name of the Study	Author	Year of Publication	Treatment Results
1.	Plasmapheresis in patients with toxic epidermal necrolysis	Barnichas G	2002 (Ther Apher)	<ul style="list-style-type: none"> <li>• 13 patients with drug-induced TEN. The patients underwent 2 to 5 PE sessions, exchanging 6.6 to 17.6 L of plasma.</li> <li>• PE sessions were carried out every other day in 8 patients and daily in 5.</li> <li>• Three patients died (23%) while the remaining 10 (77%) had a full recovery</li> </ul>
2.	Plasmapheresis in treatment in toxic epidermal necrolysis	Chaide-menos GC et al	1997 (Int J Dermatol)	<ul style="list-style-type: none"> <li>• 7 patients suffering from severe TEN underwent 1 to 4 PEs of 2.5 L on alternate days in six patients and on a daily basis in the seventh.</li> <li>• All patients recovered successfully from their disease.</li> <li>• No new lesions appeared after the first PE in four patients.</li> </ul>
3.	Plasmapheresis as an adjunct treatment in Toxic epidermal necrolysis	Egan CA, et al	1999 (J Am Acad Dermatol)	<ul style="list-style-type: none"> <li>• Out of 16 patients with a diagnosis of TEN 10 were treated with conventional support measures alone and 6 were treated with plasmapheresis.</li> <li>• 8 patients (50%) were discharged home, 4 (25%) were discharged to a rehabilitation facility, and 4 (25%) died.</li> <li>• None of the plasmapheresis-treated patients died</li> </ul>
4.	Plasmapheresis in severe drug induced Toxic epidermal necrolysis	Kamano-broo D et al	1985 (Arc Dermatol)	<ul style="list-style-type: none"> <li>• Five patients with severe drug-induced TEN improved rapidly after one to two plasma exchanges.</li> <li>• The improvement of all five patients treated with plasmapheresis contrasts with the disease's mortality rate of up to 50%, as reported in the literature and as observed among our previously treated patients</li> </ul>

**Table/Fig 1:** Studies on Plasmapheresis as an adjuvant modality of treatment of TEN [1],[3],[4],[6]

The theoretical mechanism of action involves the actual removal of the toxin or drug metabolite that was potentially responsible for the direct killing reaction of the epidermal keratinocytes. There has been a hypothesis that the mechanism involves the removal of cytokines [2],[7] which are involved in the destruction of the keratinocytes. Nonetheless, the exact mechanism remains speculative. In a six series by using plasmapheresis, it was found that there was a combined overall mortality rate of 11%. Furthermore, two studies reported the lack of ocular sequelae in the group which was treated with plasmapheresis [3],[5]. Despite the laboratory evidence of potential success, the use of corticosteroids in the treatment of TEN remains controversial [11,12]. Plasmapheresis was used in the index child on a daily basis, which was noted to have helped the child significantly. There were no new lesions after day 2 onwards. The existing lesions healed by day 7 and we could discharge the child by day 10 of the hospital stay.

## CONCLUSION

TEN is a rare, but life-threatening medical emergency with significant morbidity and mortality. Despite continued research efforts and an enhanced understanding of the likely mechanism which is involved, no specific treatment has demonstrated significant improvement. In our observation, we could see that plasmapheresis helped the child to recover early from the extensive skin lesions, thus preventing the ocular sequelae. Although the exact mechanism of action is unknown, this current modality would require further investigation to determine its efficiency and effectiveness.

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