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# A 15-year report of indications, adverse events, and effectiveness of therapeutic plasma exchange in patients with rheumatic diseases

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Therapeutic plasma exchange (TPE) is a type of treatment, which eliminates harmful antibodies, immune complexes, cytokines, and inflammatory products. Due to the lack of sufficient data on indications, effectiveness, and side effects of TPE in patients with rheumatic disease, we evaluated TPE in our center. All consecutive patients registered in university hospitals with definite rheumatologic indications for TPE during 15 years were evaluated. 680 sessions of TPE were performed on 166 patients, aged between 19 and 83 years**.** The most common underlying causes were collagen vascular diseases (60%) including systemic lupus erythematosus (SLE) (98%), and antiphospholipid antibody syndrome (APS) (1%); and then, primary small vessel vasculitis (SVV) (39.8%). The main indications for TPE in all patients were rapidly progressive glomerulonephritis (RPGN) (69.8%) and pulmonary hemorrhage (39.1%). During 12 months follow-up, in SLE and SVV patients 17 (17.3%) and 20 (30.3%) entered complete remission; 37 (37.3%) and 12 (18.1%) entered partial remission; 44 (44.8%) and 34 (51.5%) had no recovery; and 37(37%) and 19 (28.7%) died, respectively. A total of 18 (10.8%) patients experienced TPE-related adverse events during TPE [hypotension 15 (9%), allergic reaction 1 (0.6%), fever 1 (0.6%), and hypocalcemia 1 (0.6%)]. The most common indication for TPE is SLE and primary vasculitis. The RPGN and pulmonary hemorrhage were the main indications. Although the rate of response to treatment was acceptable according to the fatal nature of these complications, further case-control studies are suggested to assess the effectiveness of TPE.

***Keywords:*** *plasmapheresis; therapeutic plasma exchange; adverse event; vasculitis; systemic lupus erythematosus*

## Introduction

Therapeutic plasma exchange (TPE), also known as plasmapheresis, is an extracorporeal treatment for separating the plasma from blood-forming components and eliminating large-molecular-weight substances such as harmful antibodies, immune complexes, cytokines, and pro-inflammatory and inflammatory products with replacement fluids such as plasma or albumin into the patients' blood [1, 2]. TPE was performed by Schwab and Fahey in 1960 for the first time in patients with macroglobulinemia [3]. Then in 1975, Lockwood et al. [4] introduced TPE as the treatment of choice in patients with immunologic, renal, and rheumatic diseases. Nowadays, TPE is commonly used in combination with other disease-modifying treatments, including immunosuppressive medications [2, 5]. Several studies confirmed the improvement of renal function and alveolar hemorrhage in patients who had undergone TPE in combination with other modifying treatments


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There were several limitations to our study. As to the retrospective method of this study, selection and information bias were inevitable. Moreover, we excluded several patients who had undergone TPE in our center due to the missing information. The sample size of several diseases in our study was small, which is another limitation to our study. Therefore, further evaluations with a larger sample size and longer duration of follow-up with frequent short intervals compared to the control group will be the best way to evaluate the efficacy of TPE in patients.

## Conclusion

The current study showed that the most common indication for TPE in patients with rheumatic diseases in the south of Iran was SLE and primary vasculitis which presented with RPGN, TTP, and pulmonary hemorrhage, respectively . The most common causes of mortality in patients who underwent TPE in patients with SLE was the simultaneous occurrence of RPGN with pulmonary hemorrhage and TTP; also, in patients with primary vasculitis, RPGN with pulmonary hemorrhage was the cause of death. The side effects of plasmapheresis were rare, being mostly hypotension, allergic reaction, fever, and hypocalcemia. Although the rate of response to treatment is acceptable according to the fatal nature of these diseases in their exacerbations, further controlled studies are recommended to be performed to assess the effectiveness of applying other medications on the improvement of response to treatment and complete recovery.

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## Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this study.

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