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Abstract

Therapeutic plasma exchange; variations on a theme.

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intensivist

Abstract:

Therapeutic plasma exchange (TPE) is an established treatment modality, which can be easily applied in the intensive care unit (ICU). We discern two techniques: centrifugal plasma filtration, by which plasma is separated from whole blood by centrifugal force and membrane plasmaflitration. Membrane plasmafiltration can be easily performed on the conventional hemofiltration machine used for continuous venovenous hemofiltration, in the TPE mode with a special kit in combination with a large pore plasmafilter. Usually 1,5 times the calculated plasma volume will be removed in one session and replaced by a 5 % albumin/saline solution (70/30), fresh frozen plasma (FFP) in case of TTP, or an albumin-FFP mixture. The time interval between procedures and duration of the treatment sessions depend on the patient disease, volume of distribution of the particular substance and a given coagulopathy (1).Toxic substances or auto-antibodies can in this way be removed according to molecule mass and pore width of the filter , so determing the sieving coefficient of that particular substance. Production rate, metabolization rate and protein binding play also an Important role in the clearance of a specific substance. The complications of TPE vary from muscle cramps, urticaria and rarely anaphylaxis or transfusion related acute lung injury (TRALI). As medication is effectively erased from the body, therapeutic drug monitoring is essential (2).

There are many publications in literature on TPE but often with a low level of evidence.

The American Society for Apheresis (ASFA) has published a list of indications for TPE, ranked after grade of evidence (3).

Thrombotic thrombocytopenic purpura (TTP) is a rare life threatening disease with micro-angiopathy due to unrestrained microvascular thrombosis caused by an acquired deficiency of the von Willebrand cleaving factor

(Adamst-13). Hemolysis, thrombocytopenia, renal insufficiency and neurological symptoms dominate the clinical picture. If untreated, mortality exceeds 90 % early start of TPE results in survival rates of 20 %(4,5). Immunotherapy with an antibody against the von Willebrand factor is promising if combined with TPE (6). In hemolytic uremic syndrome (HUS) the Shigatoxin, produced by specific Escherchia coli strains (STEC), can result in a similar clinical picture (Stx-HUS) by endothelial damage by the Shigatoxin. Both diseases can be hardly distinguished from each other, and the Adamst 13 may be discriminative . Unfortunately STX-HUS responds less well to TPE. In atypical HUS (a-HUS) ongoing complement activation plays a pivotal role in pathophysiology (7).

A well known indication for TPE in hemato-oncology is the hyperviscosity syndrome in case of lymphoplasmocytic syndrome (M. Waldenström), restoring rheology.

Biography:

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Publication of speakers:

1. Schmidt JJ, Asper F, Einecke G, Eden G et al. (2018) Therapeutic plasma exchange in a tertiary care center:185 patients undergoing 912 treatments- a one year retrospective analysis. BMC Nephrology 19:12; 1-7.
2. Cheng CW, Hendrickson JE, Tormey CA, Sidhu D. (2017). Therapeutic plasma exchanged its impact on drugs levels. Am J ClinPathol 148:190-198.

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