

COMPLICATIONS OF THERAPEUTIC PLASMA EXCHANGE; 33 YEARS OF SINGLE CENTER EXPERIENCE



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Background: Therapeutic plasma exchange (TPE) is an extracorporeal blood purification technique designed for removal of large molecular weight substances from plasma. Widespread application of TPEs in the last years created growing interest in development and avoidance of its complications.

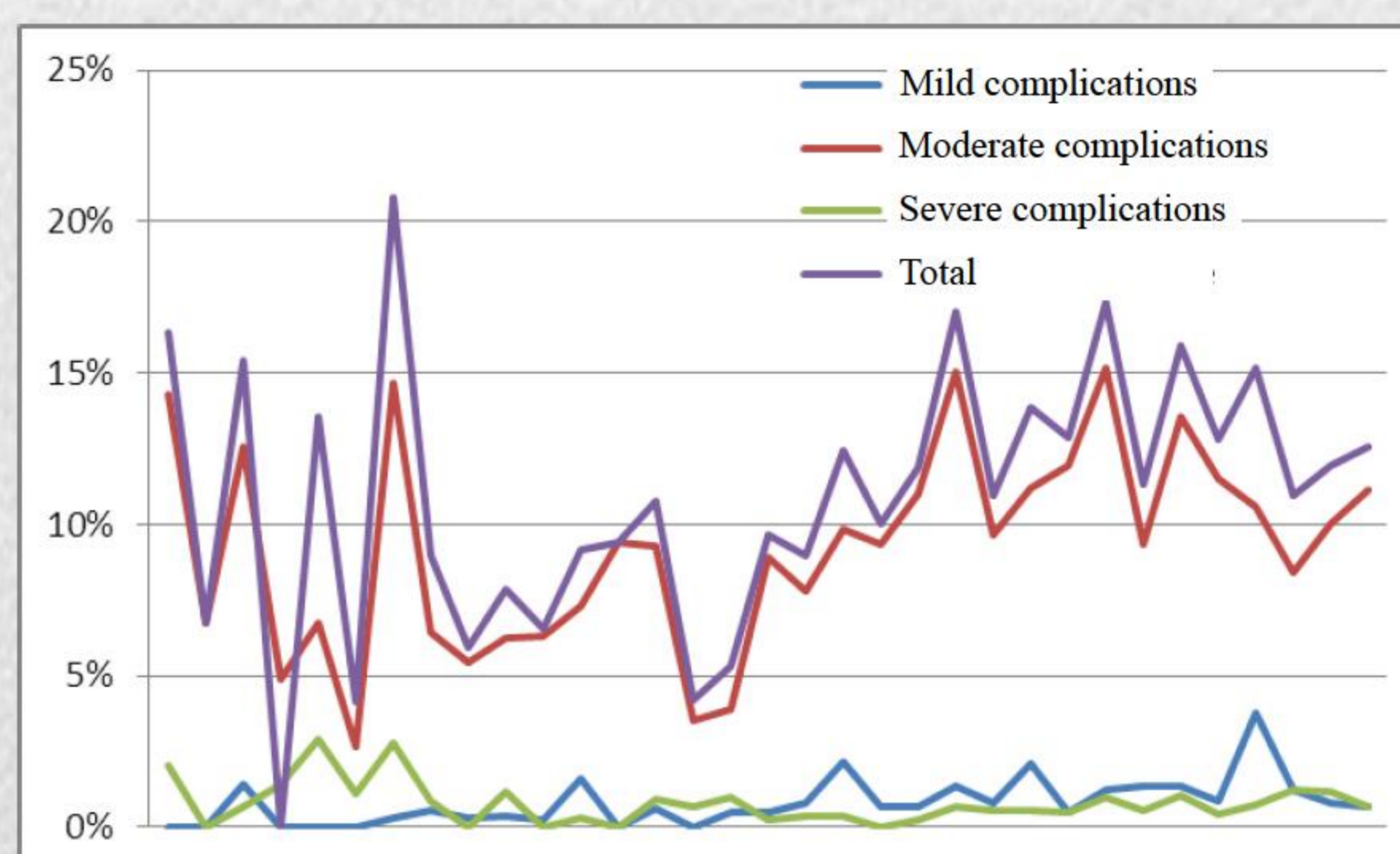
Materials and methods: We retrospectively analyzed The Department of Nephrology, Zagreb University Hospital Center's database from 1982 to 2014 to test the safety of TPE. The complications were divided according to the functional systems involved and the source of the complication (e.g., vascular access, allergic reaction, cardiovascular complications, etc.) and according to the severity (mild, not requiring medical treatment; moderate, requiring medical treatment; and severe, causing interruption of treatment).

Results: There were side effects during 1060 (11%) of the 9595 procedures done, involving 45% of the 1039 patients treated. All the procedures were performed using membrane plasma separation. The incidence of severe, potentially life-threatening adverse reactions was 0,6%, incidence of moderate adverse reactions was 9,5% and of the mild adverse reactions was 0,9%. The worst complication was cardiorespiratory arrest, which occurred in a child and was the only death reported during our study (0.0001%).

The most common reactions were clotting of blood in the extracorporeal circuit (3,5%), vascular access-related complications (2,2%), allergic reactions (1,8%) and paresthesia (1,6%). The use of fresh frozen plasma was associated with a higher rate of adverse reactions (15,8% vs. 9,6%, $p < 0,001$). Also, significantly higher percentages of complications were found in children (≤ 18 years) and elderly (≥ 65 years) compared to the adults (12,2% and 12,7% vs. 9,9%, $p = 0,007$). There was no difference in incidence of vascular access-related complications during TPE done with antecubital veins or central venous catheters, but the incidence was lower when arteriovenous fistula was used (2,5% and 2,5% vs. 0,9%, $p = 0,003$). Incidence of clotting of blood in the extracorporeal circuit was significantly higher when fractionated heparin or no anticoagulation was used during TPE compared to procedures done with unfractionated heparin (12,1%, 6,3% and 2,4% respectively, $p < 0,001$). No other anticoagulant was used during the study period. Prophylactic use of potassium was also associated with lower incidence of paresthesias (6,7% vs. 0,9%, $p < 0,001$) and complications in total (14,6% vs. 9,0%, $p < 0,001$). The calcium was prophylactically used during all TPEs.

Conclusion: Our results indicate that TPE may be performed relatively safely when carried out by experienced staff. The use of unfractionated heparin, prophylactic use of potassium and avoidance of fresh frozen plasma are associated with a lower rate of adverse reactions.

Complications of therapeutic plasma exchanger/year



Complication	Number / percentage of therapeutic plasma exchanges (N/%)
Total	1060 (11%)
Clotting of blood in the extracorporeal circuit	335 / 3,5
Vascular access	215 / 2,2
Inadequate vascular access	195 / 2,0
Allergic reactions	174 / 1,8
Urticaria	134 / 1,4
Anafilaxis	40 / 0,4
Paresthesia	154 / 1,6
Device complications	80 / 0,8
Cardiovascular	62 / 0,6
Hypotension	51 / 0,5
Gastrointestinal	22 / 0,2
Other	18 / 0,2

