

Membrane versus centrifuge based therapeutic plasma exchange



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INTRODUCTION And AIM

Therapeutic plasma exchange (TPE) is either performed using a highly permeable filter with standard multifunctional renal replacement equipment (mTPE) or a centrifugation device (cTPE).

Performance of these two modes of TPE was rarely compared in a randomized fashion. Thus, we aimed to compare two commercially available therapeutic apheresis systems: mTPE (PF 2000 N 0.3 m₂ and TPM max 100 mmhg.) and cTPE (NIGAL XJC 2000 plasma separator device) as regard efficacy and tolerability.

Methods

40 patients undergoing plasma exchange were recruited and randomized 1:1. 20 patients underwent mTPE, and 20 underwent cTPE. Procedure-related parameters were recorded, including indications for TPE, replacement fluid used, preparation time, priming time, procedure time (total session duration), flow rate, and anticoagulation used. Plasma removal efficiency (%PRE) was also estimated for all patients, and any adverse events were documented for both procedures.

RESULTS

TPE was performed for various indications across both groups. Both FFP and albumin were used as replacement fluids, with FFP being significantly more common in the m-TPE group, while albumin was more frequently used in the c-TPE group. Heparin was the anticoagulant used in all m-TPE patients, whereas sodium citrate was used in the c-TPE group. The preparation and priming times were *significantly longer* in the m-TPE group compared to the c-TPE group (Fig. 1). However, the procedure time was shorter in the m-TPE group (Fig. 2), and both the volume removed, and the volume processed were higher in the m-TPE group compared to the c-TPE group. PRE% was comparable between the two groups, with a slight trend favoring c-TPE (Fig. 3). No significant adverse events were reported in either group.

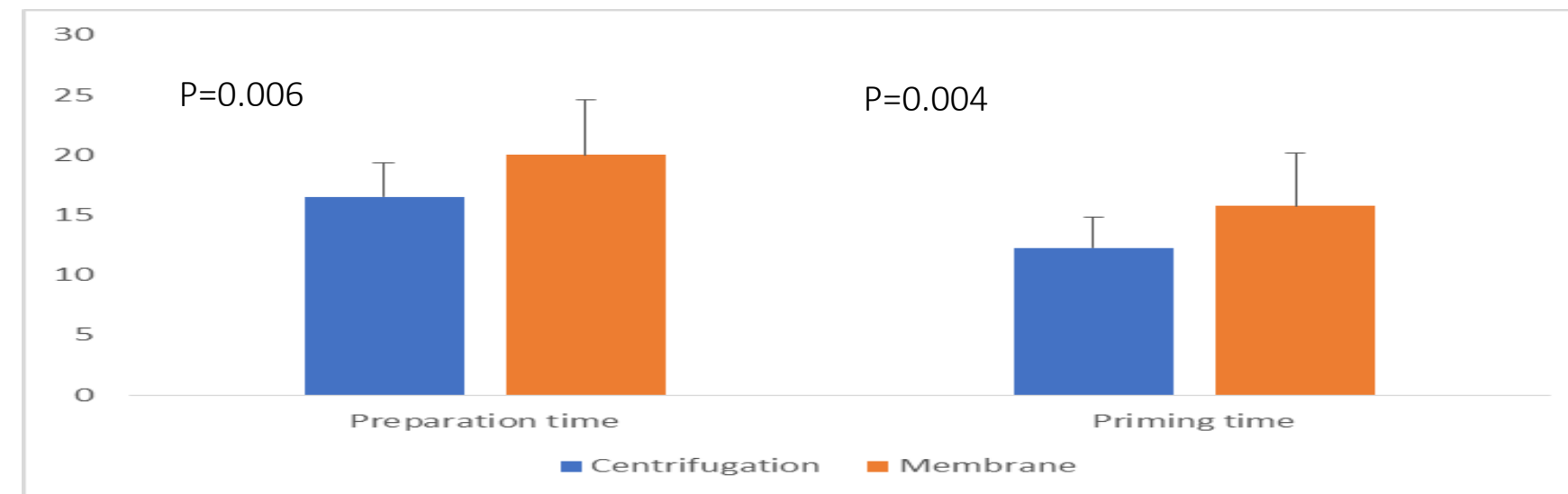


Figure 1: cTPE vs mTPE methods as regard preparation time and priming time.

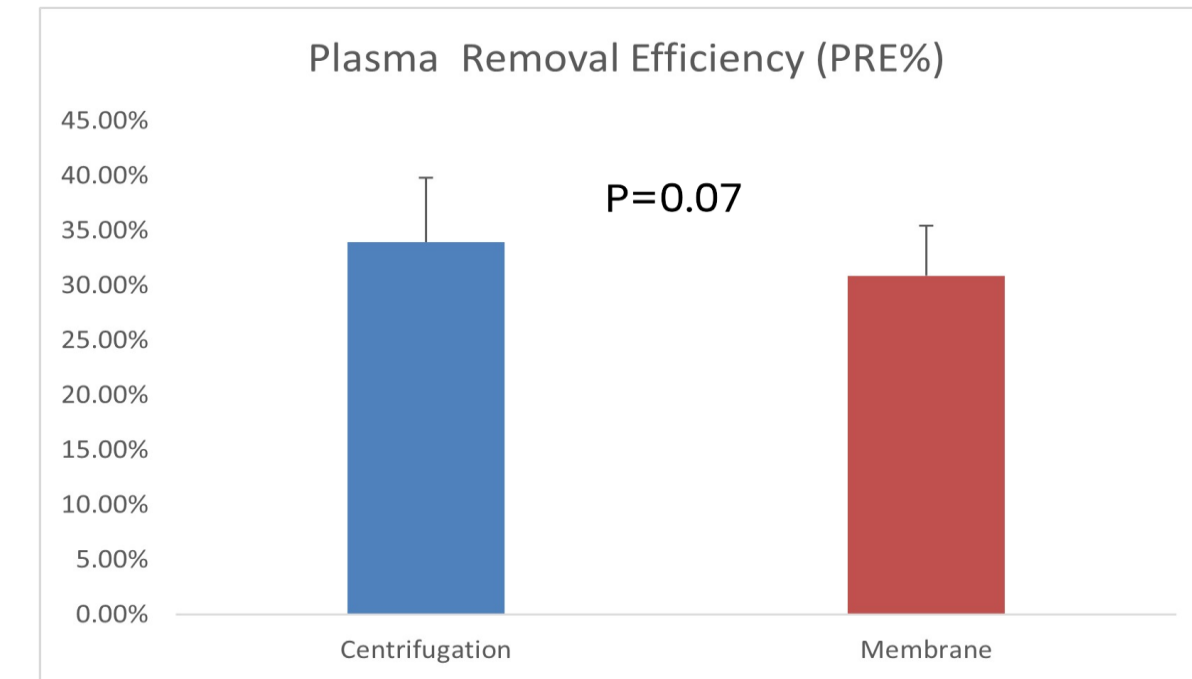


Figure 3 : cTPE vs mTPE as regard plasma removal efficiency (PRE%).

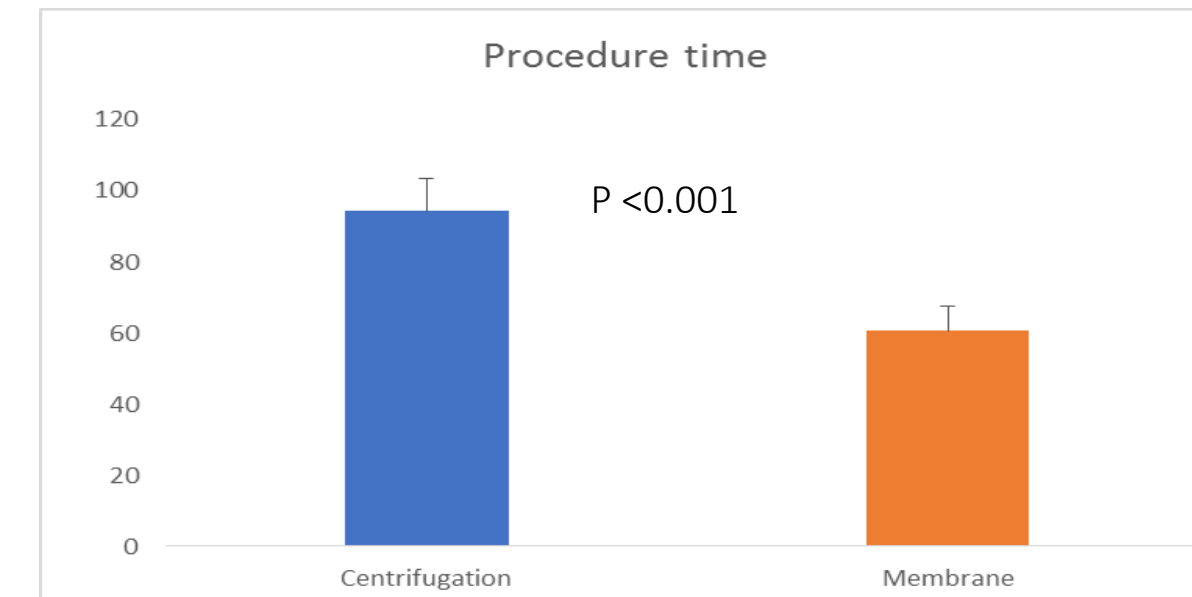


Figure 2 : cTPE vs mTPE methods as regard procedure time.

CONCLUSION

We conclude that both centrifuge and membrane methods for TPE are comparably efficient. The c-TPE method offers shorter preparation and priming times, while the m-TPE method has a significantly shorter procedure time. Plasma removal efficiency and adverse event rates were comparable between the two methods.