

Managing Atypical Reactions in Plasmapheresis Patients on ACE Inhibitors

Fellow: Janet Leiva RN, CNN, CNIII Apheresis & Hemodialysis Unit

Coach: Pauline Chin RN, MSN, Nursing Educator,

Problem: Hypotension and gastrointestinal symptoms were observed in 5 patients during therapeutic plasma exchange. All of these episodes occurred in patients receiving angiotensin converting enzyme (ACE) inhibitors.

PICO Question: In adults receiving therapeutic plasma exchange (TPE), does withholding ACE inhibitors 24 hours prior to therapy reduce the incidence of hemodynamic instability and other atypical reactions?

Background: During plasma exchange, it is postulated that the rapid infusion of albumin causes the accumulation of bradykinins in the patient (). The ACE inhibitors prolong the half-life of bradykinin and allow it to reach “toxic concentrations”. Bradykinin mediates inflammatory response, increases vasodilatation and the contraction of smooth muscle. There have been reports in the literature linking symptoms in apheresis patients taking ACE inhibitors including hypotension, flushing, nausea, abdominal cramps and diarrhea Based on this, the current recommendation is that ACE inhibitors be held at least 24 hours prior to plasmapheresis.

Practice Change: In partnership with attending physicians, plasmapheresis orders were revised to screen for ACE inhibitors, which are then discontinued 24 hours prior to treatment. The back of the order sheet now contains a list of ACE inhibitors, with a warning stating “Compliment activation is known to stimulate production of bradykinins which is a potent vasodilator. ACE inhibitors are known to block the breakdown of bradykinins which could cause an amplification of this response”.

Initial Results: Five patients on ACE inhibitors prior to the practice change had experienced adverse reactions during plasmapheresis. After the practice change, four had their ACE inhibitors discontinued 24 hours prior to therapy. . All four patients did remained symptom-free during the procedure

Next Steps: Continue to screen patients for ACE inhibitors and discontinue them before pheresising. Monitor these patients for vasodilation-related adverse effects.

References:Owen, H.G. Brecher, M.E. (1994). Atypical reactions associated with use of angiotensin-converting enzyme inhibitors and apheresis. *Transfusion* 34(10) 891-894.

Weinstein, R. (2001). Hypocalcemic toxicity and atypical reactions in therapeutic plasma exchange. *Journal of Clinical Apheresis*16 210-211.