

Aquapheresis:

Aquapheresis means taking away (apheresis, gr.) water (aqua, lat.) from the body, with an objective to restore euvolemia in fluid overloaded patients. Aquapheresis via the Aquadex FlexFlow™ is alternative to conventional ultrafiltration for patients with refractory intravascular and extravascular volume overload. Unlike CRRT, the Aquadex FlexFlow™ is highly automated, portable, and uses both central and peripheral venous access. It is a small self-contained unit resembling a programmable intravenous pump. Several studies have shown no clinically significant effect on electrolyte balance, blood pressure, or heart rate with aquapheresis. The Aquadex FlexFlow™ uses low blood flow, drawing 10-40 mL/ min. Only 33 mL of blood is in the entire circuit outside the vascular space at anytime as opposed to 300 mL with CRRT. The Aquadex FlexFlow™ can precisely remove anywhere from 10-500 mL of fluid an hour depending on patient needs and fluid status. It is important to remember that the rate of fluid removed per hour (ultrafiltration rate) from the intravascular space must not exceed the rate of fluid entering the intravascular space from the extravascular space (plasma refill rate). Setting the appropriate rate minimizes the risk of hypovolemia and hypotension. Periodic monitoring of systolic blood pressure and monitoring hematocrit with the Hematocrit Monitoring feature of the Aquadex FlexFlow™ aid in avoiding overaggressive fluid removal. Patients qualifying for aquapheresis include those who are more than five pounds over dry weight and diuretic resistant. Aquapheresis should be done before any significant administration of intravenous loop diuretics or vasoactive drugs. Fluid removal rate can be initiated at 250 mL/hr (six liters in 24 hours) with blood flow rate of 30-40 mL/ min. With these settings, approximately 3200 mg of salt will be removed with each liter of isotonic fluid. Anticoagulation with intravenous heparin to two times normal value aids in keeping the ultrafiltration filter from clotting. (13)

CONCLUSION:

Though several pharmacological and non-pharmacological measures available in treating heart failure, aquapheresis-A recent advancement in non pharmacological measures for the treatment of heart failure is more efficient in treating difficult heart failure patients with increased intra vascular and extra vascular fluid overload.

REFERENCE:

1. Demakis JG, Proskey A, Rahimtoola SH, Jamil M, Sutton GC, Rosen KM, et al. The natural course of alcoholic cardiomyopathy. *Ann Intern Med* 1974;80:293-7.
2. Jessup M, Abraham WT, Casey DE et al.: 2009 focused update: ACCF/AHA Guidelines for the Diagnosis and Management of Heart Failure in Adults: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines: developed in collaboration with the International Society for Heart and Lung Transplantation. *Circulation* 2009; 119: 1977-2016.
3. Bart BA: Treatment of congestion in congestive heart failure: ultrafiltration is the only rational initial treatment of volume overload in decompensated heart failure. *Circ Heart Fail* 2009; 2: 499-504.
4. Damman K, van Deursen VM, Navis G et al.: The Increased Central Venous Pressure Is Associated With Impaired Renal Function and increased Mortality in a Broad Spectrum of Patients With Cardiovascular Disease. *J Am Coll Cardiol* 2009; 53: 597-9.
5. Mullens JM, Abrahams Z, Skouri HN et al.: Elevated Intra-Abdominal Pressure in Acute Decompensated Heart Failure A Potential Contributor to Worsening Renal Function? *J Am Coll Cardiol* 2008; 51: 300-6.
6. Testani JM, Chen J, McCauley BD et al.: Potential Effects of Aggressive Decongestion During the Treatment of Decompensated Heart Failure Compared to Diuretics – Needs Central Vein Catheterization, Trained Staff etc. *Mielniczuk IM, Tsang SW, Desai AS et al.: The Association Between High-Dose Diuretics and Clinical Stability in Ambulatory Chronic Heart Failure Patients. J Card Fail* 2008; 14: 388-93.
8. Peacock WF, Costanzo MR, De Marco T et al.: ADHERE Scientific Advisory Committee and Investigators. Impact of intravenous loop diuretics on outcomes of patients hospitalized with acute decompensated heart failure: insights from the ADHERE registry. *Cardiology* 2009; 113 (1): 12- 9.
9. Sandhu A, Soman S, Hudson M, Besarab A: Managing anemia in patients with chronic heart failure: what do we know? *Vasc Health Risk Manag* 2010; 6: 237-52.
10. Ahmed A, Rich MW, Sanders PW et al.: Chronic kidney disease associated mortality in diastolic versus systolic heart failure: a propensity matched study. *Am J Cardiol* 2007 Feb 1; 99 (3): 393-8.
11. Al-Ahmad A, Rand WM, Manjunath G et al.: Reduced kidney function and anemia as risk factors for mortality in patients with left ventricular dysfunction. *J Am Coll Cardiol* 2001; 38: 955-62.
12. Ahmed A, Allman RM, Fonarow GC et al.: Incident heart failure hospitalization and subsequent mortality in chronic heart failure: a propensity-matched study. *J Card Fail* 2008; 14: 211-218.
13. Fonarow GC, Adams KF, Abraham WT: ADHERE Investigators. Risk stratification for in-hospital mortality in heart failure using classification and regression tree (CART) methodology: analysis of 33,046 patients in the ADHERE registry. *J Cardiac Fail* 2003; 9: S79.