Publication Brief

Effect of intradialytic change in blood pressure and ultrafiltration volume on the variation in access flow measured by ultrasound dilution.

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OBJECTIVE
NKF-KDOQI guidelines recommend that the vascular access flow assessment be performed during the first 1.5 hours of hemodialysis to eliminate error caused by decrease in cardiac output or blood pressure related to ultrafiltration and/or hypotension. This measurement time restriction to within the first 1.5 hours limits the number of measurements that can be performed by one operator, which is a significant issue in clinical practice. The aim of this study, therefore, was to evaluate, by studying the effect of intradialytic change in blood pressure and ultrafiltration volume on the variation in access flow measured by ultrasound dilution, whether access flow should be measured early during HD, or it could be measured at anytime during HD. The effect of patients’ demographic parameters on the access flow was also evaluated.

METHODS
Access flow was measured by ultrasound dilution using a Transonic HD03 Monitor in 30 patients during 89 HD sessions. Measurements were performed at 30 minutes, 120 minutes, and 240 minutes after the start of HD and the results were evaluated for variation. The mean age of the 30 patients was 62±11 years. Nineteen of the 30 patients were male. Sixteen patients had fistulas; 14 had grafts.

RESULTS
• Mean access flow over all sessions decreased by 6.1% over time (1265±568 mL/min after 30 minutes, 1260±599 mL/min after 120 minutes, and 1197±576 mL/min after 240 minutes).
• In addition, a ≥5% decrease in mean arterial pressure during HD significantly reduced access flow. Mean arterial pressure did not correlate with ultrafiltration volume.
• No other variable (ultrafiltration volume, sex, age, presence of diabetes, type or location of access, body surface area, hemoglobin, serum albumin level) interacted significantly with the effect of time on access flow.

CONCLUSION
The clinicians concluded that the variation in access flow during HD is relatively small. They found that decreased blood pressure is a risk factor for variation in access flow measured by ultrasound dilution. In most patients whose blood pressures are stable during HD, the access flow can be measured at any time during the HD treatment.

TAKE HOME
• Excellent hemodialysis paper from Korea that provides an answer to the question of when optimal access surveillance with the Transonic device should take place.
• It lists the advantages of ultrasound dilution technology measurements over Doppler ultrasound as its reproducibility, low cost, operator-independence, and ability to provide rapid feedback before and after corrective intervention.

REFERENCE: