Publication Brief

Access flow measurements in hemodialysis patients: in vivo validation of an ultrasound dilution technique.

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BACKGROUND
A new technique to measure access flow in hemodialysis patients, based on the measurement of changes in the ultrasound characteristics of blood initiated by an injection of isotonic saline and measured in the tubes of the extra-corporeal circuit is now available.

METHOD
• Access flow was measured in 46 hemodialysis patients with bridge grafts: 3 upper arm loop grafts and 43 forearm grafts (40 loop; 3 straight).
• The access flow rate was measured by a newly developed device using indicator dilution technology.
• Measurements were compared with flow rates determined by magnetic resonance angiography (N=22) and by a technique based on intra-access flow-pressure curves (r = 0.84, N = 14, P < 0.001).

RESULTS
• The access flow rate (mean +/- standard variation) was 880 +/- 440 mL/min (range, 166 to 1740).
• The mean coefficient of variation was 13.4 +/- 6.8% (median, 13.0%; range 3.5 to 29.4%).

CONCLUSION
• Measurements correlated well (r = 0.91, N = 22, P < 0.001) with flow rates determined by magnetic resonance angiography and by a technique based on intra-access flow-pressure curves (r = 0.84, N = 14, P < 0.001).
• Access flow can be measured easily at the bedside, noninvasively, and reliably by the ultrasound dilution device. The method requires little investment in time making it superior to other methods.

REFERENCE