Publication Brief

Accuracy of decrease in blood flow in predicting hemodialysis graft thrombosis

Paulson WD et al, Division of Nephrology, Louisiana State University Health Sciences Center, Shreveport, LA

BACKGROUND
A recent study showed that a single low graft blood-flow measurement (Qa) does not accurately predict graft thrombosis.

OBJECTIVE
To conduct a prospective study to determine whether percentage of decrease in Qa (DeltaQa) or adjustment of Qa for mean arterial pressure (Qa/MAP; Delta(Qa/MAP)) provides greater predictive accuracy than a single Qa measurement.

STUDY
- 83 grafts from 80 patients were monitored over periods up to 12 months for thrombosis; 8 grafts in 7 patients thrombosed so 75 grafts were analyzed.
- Qa (by ultrasound dilution) and MAP were measured monthly;
- Receiver operating characteristic curves were used to determine whether Qa, DeltaQa, Qa/MAP, or Delta(Qa/MAP) provided the combination of high sensitivity (>80%) and low false-positive rate (FPR; <20%) needed for clinical use. This level of predictive accuracy requires an area under the curve (AUC) of approximately 0.90.
- Four predictors were analyzed by a number of criteria.

RESULTS
- All AUCs were less than 0.90 and adjustment for MAP reduced the AUC.
- In predicting thrombosis within 1 month, for example, AUCs for Qa and net DeltaQa (over 3 months) were 0.84 and 0.82, respectively, whereas AUCs for Qa/MAP and net Delta(Qa/MAP) were 0.78 and 0.75, respectively.
- At a sensitivity of 80%, false positive rates for all predictors were at least 30%. Thus, a high sensitivity always required a high false positive rate

CONCLUSIONS
- Results show that DeltaQa and adjustment for MAP are not more accurate than a single low Qa in predicting thrombosis.
- None of the predictors provide enough predictive accuracy to be the sole criterion for clinical decision making.
- A successful monitoring and intervention program will likely require the inclusion of other predictors that, together with Qa, may provide the needed accuracy.

REFERENCE