

Publication Brief

Accuracy of decrease in blood flow in predicting hemodialysis graft thrombosis

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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

Paulson WD, Ram SJ, Birk CG, Zapczynski M, Martin SR, Work J, "Accuracy of decrease in blood flow in predicting hemodialysis graft thrombosis," *Am J Kidney Dis.* 2000 Jun;35(6):1089-95. <https://www.ncbi.nlm.nih.gov/pubmed/10845822> (Transonic Reference # HD198A)

Paulson(DL-HD198A-pb)RevA2019USltr