

Publication Brief

Adding access blood flow surveillance reduces thrombosis and improves arteriovenous fistula patency: a randomized controlled trial

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INTRODUCTION

Stenosis is the main cause of arteriovenous fistula (AVF) failure. When thrombosis occurs, it is usually necessary to place a central venous catheter that increases costs, the risk of infection, and hospital admissions..

OBJECTIVE

Because it is still unclear whether surveillance based on vascular access blood flow enhances AVF function and longevity, this three-year follow-up randomized, controlled, multicenter, open-label trial was conducted to assess whether measurement of flow, based on a combination of two technologies, Doppler Ultrasound and ultrasound dilution could reduce thrombosis, increase thrombosis-free and secondary patency of arteriovenous fistulas, and reduce vascular access-associated costs.

METHODS

AVFs were randomized to either:

- Flow Surveillance Group: In addition to classic surveillance based on venous pressure, recirculation and dialysis dose, flow was measured on the same day every three months by Doppler ultrasound (M-Turbo® and ultrasound dilution (Transonic) (n = 103);
- Control group (classic surveillance;)(n = 104)

The flow group's criteria for intervention included: 25% reduction in flow, 50% reduction in vessel lumen and hemodynamic repercussion [Peak Systolic Velocity (PSV) >400 mL/min or PSV stenosis/PSV pre-stenosis > 3).

RESULTS

- At the end of the three-year follow-up period, the surveillance group displayed significantly fewer thromboses compared to the control group: (0.025 versus 0.086 thrombosis/patient/year);
- There was a significant improvement in the thrombosis-free patency rate (HR, 0.30; 95% CI, 0.11-0.82; p = 0.011) and in the secondary patency rate in the flow surveillance group (HR, 0.49; 95% CI, 0.26-0.93; p = 0.030).
- There was no differences in non-assisted primary patency rate between the two groups;
- There was a greater need for central venous catheters and more hospitalizations associated with vascular access in control group compared to the surveillance group (p = 0.034/p = 0.029).
- Control group vascular access-related costs were considerably higher (€227.194 vs. €133.807) than in the flow surveillance group.

CONCLUSION

Flow-based surveillance combining Doppler ultrasound and ultrasound dilution reduces the frequency of thrombosis, is cost effective, and improves thrombosis free and secondary patency in autologous AVF.

TAKE HOME

- Findings for thrombosis rate and thrombosis-free AVF survival are consistent with the RCT by Tessitore *et al.*²
- First RCT to author's knowledge that shows secondary patency rate improvement using these two technologies (Doppler ultrasound and ultrasound dilution).

REFERENCES

- 1Aragoncillo I *et al.*, "Adding access blood flow surveillance reduces thrombosis and improves arteriovenous fistula patency: a randomized controlled trial," J Vasc Access. 2017; 18(4): 352-358. (Transonic Reference # HD11190A)
- 2Tessitore I *et al.*, "Neprol Dial Transplant 2004; 19: 2325-2333. (Transonic Reference # HD407A) HD11190AAragoncilloHDPubBriefRevA2017USltr

