

Access Blood Flow Surveillance in Native Arteriovenous Fistula: Reduction in Thrombosis Rate and Improvement in Assisted and Secondary Patency. A Randomized Clinical Trial

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Background:

Stenosis is the main cause of arteriovenous fistula (AVF) failure. It is still unclear if surveillance based on Vascular Access Blood Flow (QA) enhances AVF function and longevity.

Methods:

3-year follow up randomized, controlled, multicentric, open-label trial, comparing QA surveillance (pre-emptive repair of subclinical stenoses with angioplasty and/or open surgery) with standard monitoring/surveillance (intervention based on classic criteria) in mature autologous AVFs. AVFs were randomized to either control group (surveillance based on venous pressure, recirculation, dialysis dose...; n=104) or to QA group [QA was measured quarterly using doppler ultrasound (M-Turbo®) and ultrasound dilution method (Transonic®) n=103]. The criteria for intervention in QA group were 25% reduction in QA, QA <500 ml/min or significant stenosis with >50% reduction in vessel lumen and haemodynamic repercussion [Peak Systolic Velocity (PSV) >400ml/min or PSV stenosis/PSV pre-stenosis > 3).

Results:

Significant reduction in thrombosis rate (0,025 thrombosis/patient/year in the QA group compared with 0,086 thrombosis/patient/year in control group. p= 0,007) Significant improvement in assisted primary patency rate and secondary patency rate in QA group (HR 0,30 CI 0,11-0,82. P=0,011 / HR 0,49 CI 0,26-0,93. p=0,030) No differences in non-assisted primary patency rate between groups (HR 0,98 CI 0,57-1,61. p=0,935). Higher needs of central venous catheter and hospitalizations related with VA in control group (p<0,001 / p=0,003). - Higher total VA related costs in control group (217.845 € vs 124.186 €. p=0,029).

Conclusions:

QA based surveillance combining doppler ultrasound and ultrasound dilution method prevents thrombosis, increases assisted and secondary patency rate in AVF and it is cost effective.