

Vasc-Alert® is an Effective Tool to Predict Venous Stenosis

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Abstract

Background: Vasc-Alert® has been shown to be an effective tool for access surveillance. The relationship between Vasc-Alert® and events defined as venograms showing greater than 50% stenosis or thrombosis is unknown.
Methods: 234 hemodialysis patients with a functioning vascular access (graft or fistula) were enrolled by IRB approved written consent. Vasc-Alert® surveillance began 05/01/05 and ended 10/31/2005. The study coordinator reviewed data and referral for a venogram was made if the patient was having an alert (VAPR of 0.55 for 3 consecutive treatments).
Results: 110 subjects were sent for 133 venograms. 20 patients had a thrombotic event. The events were analyzed and sensitivity and specificity was found to be 90%. The positive predictive value was 93%, with a negative predictive value of 88%. The false positive rate was 10%. Fistulas showed more central lesions than grafts.
Conclusion: Vasc-Alert® is a clinically useful tool to predict venous stenosis.

Objective

- To determine if surveillance using Vasc-Alert® is predictive of venous stenosis.
- To determine the anatomic stenotic lesion and degree of stenosis that correlates with a Vasc-Alert®.

Background

The cost and placement of vascular access for hemodialysis is enormous. Current guidelines and studies recommend non-invasive access surveillance; with follow up invasive procedures as indicated (1,2). Non-invasive tools include the Vasc-Alert® device. Vasc-Alert® is an indirect measurement and mathematical calculation of venous access pressure, which occurs at each hemodialysis treatment. Previous studies have shown that once the VAPR is greater than 0.55 on three subsequent treatments, there is a risk of thrombosis (3). It is unknown what correlation VAPR has with the degree of stenosis as measured objectively by interventional radiology measurements. **The current study is being done to determine the predictive value of VAPR and the correlation it has with the anatomic lesion as described by an Interventional Radiology study.**

Methods

Vasc-Alert® extracts most recent Hct from database and calculates VAPR at BFR > 200 mL/min, VDP > 20 mm Hg, Map > 65 mm Hg. VAPR = VAP/MAP.
 Vasc-Alert® monitoring was performed on 110 patients at three chronic outpatient units for a period of six months. When an alert was detected, the patient was referred for a venogram as it was clinically indicated.

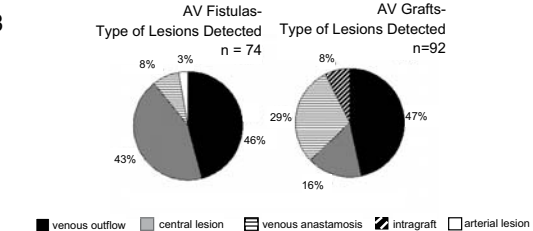
Results

- 110 hemodialysis patients were sent for 133 venograms, 98 were sent triggered on a decision initiated from a positive result from Vasc-Alert®.
- 20 subjects had a thrombotic event.
- Of 98 patients sent for venograms, 93 (95%) were found to have one or more significant stenosis.
- See results in table and diagram.

Results/Table

Sensitivity (%) (True positive predictions / all patients with incidents)	90% 108 / (108+12)
Specificity (%) (True negatives / all patients without incidents)	90% 88 / (88+10)
Positive Predictive Value (%) (True positive predictions / all positive predictions)	93% 108 / (108+10)
Negative Predictive Value (%) (True negative predictions / all negative predictions)	88% 88 / (88+12)
False Positive Rate (%) (False positive predictions / all negatives)	10% 10 / (88+10)

Results/Diagram



Discussion

- Vasc-Alert® was predictive of venous stenosis.
 - Frequency of venous outflow stenosis was consistent in both access types.
 - Fistulas showed more central lesions than grafts.
- Hemodialysis access surveillance is a useful tool to predict venous stenosis.

References

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