Arrhythmias - Catheter Ablation of Arrhythmias

Comparative effectiveness of ventricular tachycardia ablation versus escalated antiarrhythmic drug therapy by location of myocardial infarction: A sub-study of the VANISH trial

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BACKGROUND: Complexity of ventricular tachycardia (VT) substrate, efficiency of lesion formation, and the size and thickness of infarction area border zones differ based on location of myocardial infarctions (MI). These differences may translate into heterogeneity in risk of events and effectiveness of treatments for VT. Small observational studies suggest that VT from inferior infarctions have higher risk of early recurrence despite smaller infarct areas. However, differential effectiveness of VT treatments based on location of MI not been definitively established.

PURPOSE: The objective of this sub-study of the Ventricular tachycardia AblatioN versus escalated antiarrhythmic drug therapy in ISchemic Heart disease (VANISH) randomized trial was to compare the effectiveness of VT ablation by location of MI in reducing the composite endpoint of all-cause mortality, VT storm, or appropriate ICD therapy when compared to escalated pharmacological therapy in VT patients with a prior MI.

METHODS: VANISH participants were categorized into 3 subgroups based on MI location: 1. Inferior (may also have MI in other locations); 2. Non-inferior (no inferior MI, all patients not in group 1); and 3. Anterior (may also have MI in other locations). Inverse probability of treatment weighting was used to balance baseline characteristics (ie. age, sex, comorbidities, medications, and the location of additional infarctions) between patients randomized to ablation or escalated therapy within each subgroup. Weighted Cox proportional hazards models were calculated separately for each subgroup.

RESULTS: Of 259 patients enrolled in the VANISH trial [median age 69.8 (IQR 63.0-74.2) years, 7.0% women], 135 had an inferior MI, 124 a non-inferior MI, and 83 an anterior MI. Among patients with an inferior MI, no statistically significant difference in the primary outcome was detected between patients randomized to ablation or escalated therapy [aHR 0.78 (95% CI 0.51-1.20)]. In contrast, patients with non-inferior MIs had a statistically significant reduction in the incidence of the primary outcome with ablation [aHR 0.48 (95% CI 0.27-0.86)]; which was of greater magnitude than the reduction observed in the overall results of the VANISH trial [HR 0.72 (95% CI 0.53-0.98)]. In addition, a trend towards a reduction in the primary outcome with ablation was detected in patients with anterior MIs [aHR 0.50 (95% CI 0.23-1.09)].

CONCLUSION: The effectiveness of VT ablation versus escalated pharmacological therapy varies based on the location of the MI. Patients with MI scars located only in non-inferior regions of the ventricles derive greater benefit from VT ablation in reducing VT-related events. Further studies are required to explore reasons for this finding and to assess the impact of VT treatment strategies based on MI location in optimizing outcomes.