Abstract: Catheter ablation versus medical therapy for treatment of symptomatic frequent ventricular premature complexes as a first-line therapy in pediatric population: One-year follow up of a randomized study

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Topic(s):
Ablation of Ventricular Arrhythmias

Citation:
Background: Idiopathic premature ventricular complexes (PVCs) in pediatric population are not uncommon. In the absence of structural heart disease they are usually benign. However, there is evidence that PVCs can cause significant morbidity, the development of heart failure and in some cases lead to death. Radiofrequency ablation is a safe and effective treatment for symptomatic frequent PVCs in adults, especially in case of arrhythmia source localization in the outflow tracts, but the data in pediatric population are limited with small number of patients and observational or retrospective studies design.

Purpose: To test the effectiveness and safety of catheter ablation (CA) of frequent symptomatic PVCs in the pediatric population as first-line therapy compared with antiarrhythmic drug therapy (ADT).

Methods: One hundred twenty-four patients (mean age 12±3.3 years, range 7-17 years) with symptomatic, frequent PVCs =10,000 by 24-hour Holter monitoring without previous ADT were randomized to either MED group (MED group, n=62) or CA group (CA group, n=62). The primary study end point was freedom from PVCs at a rate of ≥300 beats per day documented on 24 h Holter monitoring at 12-month after randomization. Key secondary end points included periprocedural complications, absolute number and burden of PVCs. Patients were followed at 1, 3, 6 and 12 months after randomization.

Results: The were no differences in baseline number of PVCs and PVCs burden between MED and CA groups (1719±4938 vs 1688±9823; p=0.67 and 15.6% vs 15.8%; p=0.72, respectively) At the end of 12 months, the freedom from PVCs was 48.4% in the MED group as compared to 77.4% in the CA group (p=0.001, log-rank test; hazard ratio 0.38, 95% confidence interval 0.2–0.7, p= 0.002) (Figure). The most common origin of PVCs in CA group was right ventricle outflow tract (32% of the cases). In the CA group one (1.6%) patient developed groin hematoma after the procedure, which was recovered before discharged. The absolute number of PVCs and PVCs burden at the end follow up was significantly lower in the CA group compared to the MED group: 2853±5813 vs 11591±12474 (p < 0.001) and 2.6%±5.3% vs 10.4%±11.2% (p<0.001), respectively. There were no serious adverse events during follow up in either group.

Conclusions: Catheter ablation of frequent, symptomatic PVCs in pediatric population as a first-line therapy is superior over medical therapy for preventing PVCs recurrence and burden without serious procedural complications Clinical Trials Registration: NCT02772354
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HR 0.38 95% CI [0.2-0.7] p=0.002 by Cox regression

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