JACC Clin Electrophysiol. 2020 Sep;6(9):1103-1114. doi: 10.1016/j.jacep.2020.04.025. Epub 2020 Jul 29.

Prevalence and Prognostic Impact of Pathogenic Variants in Patients With Dilated Cardiomyopathy Referred for Ventricular Tachycardia Ablation

Micaela Ebert [1], Adrianus P Wijnmaalen [1], Marta de Riva [1], Serge A Trines [1], Alexander F A Androulakis [1], Claire A Glashan [1], Martin J Schalij [1], J Peter van Tintelen [2], Jan D H Jongbloed [3], Katja Zeppenfeld [4]

Affiliations
PMID: 32972544 DOI: 10.1016/j.jacep.2020.04.025

Abstract

Objectives: This study aimed to assess the frequency of (likely) pathogenic variants (LP/Pv) among dilated cardiomyopathy (DCM) ventricular tachycardia (VT) patients referred for CA and their impact on procedural outcome and long-term prognosis.

Background: The prevalence of genetic variants associated with monomorphic VT among DCM is unknown.

Methods: Ninety-eight consecutive patients (age 56 ± 15 years; 84% men, left ventricular ejection fraction [LVEF] 39 ± 12%) referred for DCM-VT ablation were included. Patients underwent electroanatomical mapping and testing of ≥55 cardiomyopathy-related genes. Mapping data were analyzed for low-voltage areas and abnormal potentials. LP/Pv-positive (LP/Pv+) patients were compared with LP/Pv-negative (LP/Pv-) patients and followed for VT recurrence and mortality.

Results: In 37 (38%) patients, LP/Pv were identified, most frequently LMNA (n = 11 of 37, [30%]), TTN (n = 6 of 37, [16%]), PLN (n = 6 of 37, [16%]), SCN5A (n = 3 of 37, [8%]), RBM20 (n = 2 of 37, [5%]) and DSP (n = 2 of 37, [5%]). LP/Pv+ carriers had lower LVEF (35 ± 13% vs. LP/Pv-: 42 ± 11%; p = 0.005) and were less often men (n = 27 [73%] vs. n = 55 [90%]; p = 0.03). After a median follow-up of 2.4 years (interquartile range: 0.9 to 4.4 years), 63 (64%) patients had VT recurrence (LP/Pv+: 30 of 37 [81%] vs. LP/Pv-: 33 of 61 [54%]; p = 0.007). Twenty-eight patients (29%) died (LP/Pv+: 19 of 37 [51%] vs. LP/Pv-: 9 of 61 [15%]; p < 0.001). The cumulative 2-year VT-free survival was 41% in the total cohort (LP/Pv+: 16% vs. LP/Pv-: 54%; p = 0.001). The presence of LP/Pv (hazard ratio: 1.9; 95% confidence interval: 1.1 to 3.4; p = 0.02) and unipolar low-voltage area size/cm^2 increase (hazard ratio: 2.5; 95% confidence interval: 1.6 to 4.0; p < 0.001) were associated with a decreased 2-year VT-free survival.

Conclusions: In patients with DCM-VT, a genetic cause is frequently identified. LP/Pv+ patients have a lower LVEF and more extensive VT substrates, which, in combination with disease progression, may contribute to the poor prognosis. Genetic testing in patients with DCM-VT should therefore be recommended.

Keywords: catheter ablation; dilated cardiomyopathy; genetic mutation; genetic testing; genetic variant; inherited cardiomyopathy; nonischemic cardiomyopathy; ventricular tachycardia.

LinkOut - more resources

Full Text Sources

ClinicalKey

Miscellaneous

NCI CPTAC Assay Portal