COGIA – Clinical course, outcome and genetics of inherited arrhythmias in children: interim analysis of a multicenter study

Lippert L[1], Burkard T[1], Wagner F[2], Debus V[3], Stute F[4], Kamphues A[5], Dalla Pozza R[5], Rupp S[6], Gonzalez M[6], Junge C[7], Kanaan M[8], Hoff K[9], Hanser A[10], Dittmann S[3], Westphal D[1], Clauss S[5], Hitz M-P[9], Becker K[9], Kääb S[5], Ewert P[1], Hofbeck M[10], Waellisch W[12], Dittrich S[12], Uebing A[9], Nürnberg J-H[11], Hebe J[11], Kozlik-Feldmann R[4], Beerbaum P[7], Kerst G[8], Kehl HG[3], Schulze-Bahr E[3], Gebauer R[2], Hessling G[1], Wolf CM[1]

Affiliations:
[1] German Heart Center Munich, Technical University Munich
[2] German Heart Center Leipzig, Leipzig University
[3] University Hospital Münster
[4] University Hospital Hamburg
[5] Hospital Ludwig-Maximilians-University Munich
[6] University Hospital Giessen and Marburg
[7] University Hospital Hannover
[8] University Hospital Aachen
[9] University Hospital Kiel
[10] University Hospital Tübingen
[11] Electrophysiology Bremen
[12] University Hospital Erlangen

Background
Clinical management and sudden arrhythmic death risk stratification remain challenging in children with inherited arrhythmia syndromes, such as Long QT syndrome (LQTS), Brugada syndrome (BrS) and catecholaminergic polymorphic ventricular tachycardia (CPVT).

Objectives:
The primary objective was to describe clinical course, molecular genetics and outcome in children and adolescents with congenital arrhythmia syndromes. The secondary objective was to identify clinical and genetic risk factors for the occurrence of malignant arrhythmias and (aborted) sudden cardiac death.

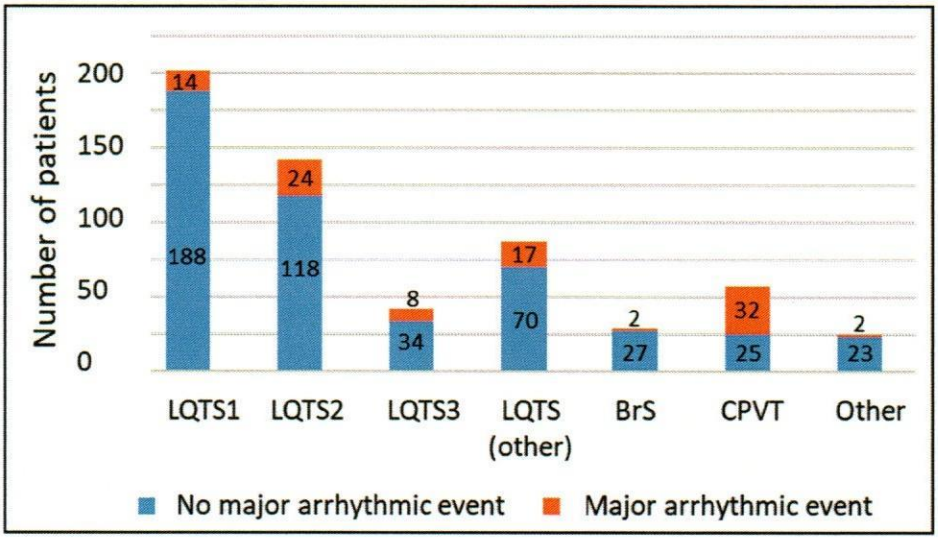
Methods
Retrospective multicenter (12 tertiary care pediatric cardiology centers) data collection from patients with a clinical and/or molecular genetic diagnosis of an inherited arrhythmia syndrome ≤ 18 years. Major arrhythmic event (MEA) was defined as sudden cardiac death (SCD), aborted sudden cardiac death, appropriate discharge of implantable cardioverter-defibrillator (ICD), or documented sustained ventricular tachycardia.

Results
Interim analysis was performed on 632 patients with childhood onset inherited arrhythmia syndrome. Age at diagnosis and follow-up time were in median 6.1 [IQR 0.4;11.3] years and 4.5 [IQR 1.9;9.4] years, respectively. Diagnosis at last follow-up was LQTS in 465 (LQTS1 N=207, LQTS2 N=143, LQTS3 N=42, other LQTS N=73), BrS in 62, CPVT in 57 and other in 48 patients. A (likely) pathogenic genetic variant was identified in 502 of 583 patients tested (86.1%). An ICD was implanted in 118 patients (18.7%) at a median age of 12.8 [IQR 8.2;15.8] years, with

45 patients (38.1%) receiving an appropriate shock during follow-up. At last follow-up, 514 patients (81.3%) received cardiac medications.
A total of 101 patients (16%) experienced a MAE during follow-up, including sustained ventricular tachycardia (N=21), aborted sudden death or appropriate ICD discharge (N=78), and SCD (N=2). The likelihood of experiencing a MAE was highest in patients with a diagnosis of CPVT (see Figure).

Conclusion

Major arrhythmic events are not uncommon in children with inherited arrhythmia syndromes, especially in those with a diagnosis of CPVT. This multicenter dataset will help to identify clinical and genetic factors associated with increased arrhythmic risk in pediatric onset ion channelopathies.



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