

### Pediatric (aborted) sudden cardiac death: focus on cardiac etiologies and family history

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Introduction: Sudden cardiac death (SCD) accounts for approximately 10% of total pediatric mortality. Studies on the etiology of (aborted) SCD < age of 40 years have shown a significant contribution of inheritable cardiac conditions (ICC). This knowledge stresses the importance of a thorough family history.

Aim: To identify the distribution of cardiac etiologies and the cardiac family history in pediatric (aborted) SCD victims.

Methods: (Aborted) SCD victims <19 years were identified from two prospectively developed resuscitation databases, including three tertiary referral centers, between 2002 till 2016. (Aborted) SCD was defined as an out-of-hospital unexpected and abrupt loss of consciousness with loss of vital signs, resulting in death or, if successfully resuscitated, survival to hospital discharge, with a (suspected) cardiac etiology. Medical records were retrospectively reviewed on etiology of (aborted) SCD and family history.

Results: 138 (aborted) SCD victims were identified. The median age was 1.9 years; 64% were male. 30% (n=41 of 138) was diagnosed with a (potential) ICC (n=20 primary electrical diseases, n=21 cardiomyopathies). 19% (n=26 of 138) was diagnosed with a primary non-ICC. In 51% (n=71 of 138) the etiology remained unspecified. 24% (n=10 of 41) of patients with a (potential) ICC had a positive family history for (potential) ICC. In unspecified cases, the family history was reported in 45% (n=32 of 71), of whom 16% (n=5 of 32) was positive for (potential) ICC.

Conclusion: Up to one third of pediatric (aborted) SCD was due to (potential) ICC. A significant proportion of these children had a positive cardiac family history at time of (aborted) SCD. In the majority of unspecified (aborted) SCD cases, no cardiac family history was reported. Societal and medical awareness of the importance of a positive cardiac family history might improve the identification of children at risk for SCD, as well as provide unsolved etiologies in (aborted) SCD victims.

| Family history   | Positive  | Negative  | Unknown   |
|--|-----------|-----------|-----------|
| Cardiac etiology, n (%)  |           |           |           |
| (Potential) ICC<br>(primary electrical<br>disease, cardiomyopathy) | 10 (24.4) | 26 (63.4) | 5 (12.2)  |
| Primary non-ICC  | 3 (11.5)  | 13 (50.0) | 10 (38.5) |
| Unspecified  | 5 (7.0)   | 27 (38.0) | 39 (54.9) |
| Total  | 18 (13.0) | 66 (47.8) | 54 (39.1) |