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Low Incidence of Ventricular Tachycardia/Fibrillation as the First Presenting Rhythm in Out-of-Hospital Cardiac Arrest Patients: Evidence From the Taichung Sudden Unexpected Death Registry (THUNDER) in East Asia

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Abstract:

Background: Ventricular tachycardia/fibrillation (VT/VF) as the first presenting rhythm is a critical indicator linking to better chance of survival to hospital discharge in patients with out-of-hospital cardiac arrest (OHCA). Compared with a well-documented incidence of 20–30% of VT/VF in Caucasian OHCA patients, the information remains quite limited in East Asian populations. This study aimed to determine the incidence of VT/VF as the first presenting arrhythmia in OHCA patients based on the Taichung Sudden Unexpected Death Registry (THUNDER) in Taiwan.

Methods and Results: The THUNDER program encompasses a metropolitan city at central Taiwan with a population size of 2.7 million and 17 destination hospitals for OHCA patients. This registry including information on demographics, emergency medical service (EMS) records, and the hospital data according to the Utstein style was constructed using the EMS run sheets of OHCA cases transported by the 119 EMS ambulances. An automated external defibrillator (AED) was routinely used for initial evaluation of each OHCA case. From May 1, 2013 to May 31, 2014, a total of 2156 EMS-assessed OHCAs was analyzed. After excluding 283 cases with non-cardiac OHCA and 114 with incomplete information, the remaining 1759 cases with presumed cardiogenic OHCA constitute the study population. Of these patients, the mean age was 70.4 ± 28.5 years with male predominance (65.2%). The median EMS response time from call help to arrival was 6.0 min (interquartile range: 5–8 min) and the AED machine-read shockable rhythm was registered in 7.7% of all study patients. In a subset of OHCA cases with AED-stored ECG data for analysis ($n=1153$), the AED-recorded VT/VF, verified by experienced cardiologists, as the first presenting arrhythmia occurred in 8.0% of this subgroup of patients. The overall survival to hospital discharge rate was 3.8%.

Conclusions: We demonstrate a low incidence of VT/VF in patients with presumed cardiogenic OHCA according to both machine-read and cardiologist-adjudicated VT/VF rhythm. Our findings suggest a different causative mechanism of sudden cardiac death between Asian and Caucasian populations.

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