Sudden cardiac death related to physical exercise and sports in the young: a nation-wide cohort study of Australia

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Background: Sudden cardiac death (SCD) during physical exercise is uncommon but devastating.

Purpose: We aimed to determine risk factors, causes and circumstances of sports and exercise-related SCD in the young in Australia.

Methods: We retrospectively reviewed the National Coronial Information System (NCIS) registry for deaths in Australia relating to cardiovascular disease (CVD) in cases aged 10 to 35 years between 2000-2016. Included cases had been undertaking sports or physical exercise at time of event. We collected baseline demographics and circumstances of death including location, type of physical exercise, whether the event was witnessed, and engagement of bystander cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) use prior to ambulance arrival.

Results: Over a 17-year period, 1,925 SCD cases were identified of which 110 cases (6%) related to sports/physical exercise were included in final analysis. Median age was 27 years (interquartile range [IQR] 21-32 years) with most being male (92%). Median BMI was 27 kg/m2 (IQR, 23-30) with 13 cases (12%) occurring in active athletes. Most common causes were coronary artery disease (CAD; 37%) and sudden arrhythmic death syndrome (SADS; 20%). Australian Rules Football (24%), running/jogging (14%) and soccer (14%) were the most frequently practiced at time of event. Prior symptoms were present in 39% (chest pain 37%, presyncope/syncope 26%). Most were witnessed (87%) with bystander CPR in 70%. AED use prior to ambulance arrival was 8%.

Conclusions: This study demonstrates the high occurrence of CAD and SADS in exercise-related SCD in the young. Although events were commonly witnessed, an AED was seldom used prior to ambulance arrival highlighting an important opportunity to improve outcomes in the post-arrest chain of survival.