



### H38 HIV Post-Sudden Cardiac Death (SCD): Rates of Autopsy-Defined Sudden Arrhythmic Death (SAD) Are 80% Higher in Persons With HIV

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**Learning Overview:** This presentation will show that autopsy material informs the living. After attending this presentation, attendees will know that certain chronic HIV infection increases the risk of sudden death.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by showing that HIV-infected persons are more likely to die suddenly of an arrhythmic death, and they may benefit from the implantation of a defibrillator.

**Background:** Persons living with HIV have higher rates of Cardiovascular Disease (CVD), including acute myocardial infarct and heart failure. High rates of out-of-hospital presumed SCDs were first reported using World Health Organization (WHO) criteria.<sup>1</sup> However, the precise incidence of actual SADs in HIV remains unknown.

**Methods:** Between 2011 to 2016, this study prospectively identified all incident deaths attributable to out-of-hospital cardiac arrest among individuals with and without HIV aged 18–90 years in San Francisco County for medical records review and comprehensive autopsy, toxicology, and histology via medical examiner surveillance of consecutive out-of-hospital deaths. Autopsy-defined SAD had no extracardiac cause of death or acute heart failure. Final cause was adjudicated by a committee of pathologists, cardiologists, HIV clinicians, and electrophysiologists.

**Results:** One hundred twenty-six out-of-hospital HIV-infected deaths were identified, and 47 of these met WHO SCD criteria. The mean age was 65.6 years, 94% were male, 57% were White. Compared to uninfected WHO-defined (presumed) SCDs ( $N=505$ ), SCDs with HIV were more likely to have a history of myocardial infarct, psychiatric disorder, cigarette smoking, and substance abuse. About half (22 of 47, 47%) of WHO-defined SCDs were autopsy-defined SADs; the remainder were non-cardiac and included 16 due to occult overdose. Presumed SCDs with HIV were more likely to be due to occult overdose (13% vs. 34%,  $p<0.0001$ ) and renal failure (1% vs. 6%,  $p=0.0031$ ) as compared to uninfected presumed SCDs. Adjusted incidence ratios for WHO (presumed) SCDs and autopsy defined SADs were both significantly higher in HIV (IRR 1.82, 95%CI 1.4–2.4,  $p<0.0005$  and IRR 1.83, 95%CI 1.2–2.8,  $P=0.006$ , respectively). After adjustment for age, gender, heart disease, and Coronary Artery Disease (CAD), SCDs with HIV had 60% higher interstitial fibrosis by myocardial trichrome staining compared to uninfected SCDs.

**Conclusions:** In this countywide postmortem study, one-third of apparent SCDs in HIV over a five-year period were due to occult overdose. However, adjusted rates of both presumed SCDs and autopsy-defined SADs were 82% and 83% higher, respectively, in HIV compared to the uninfected population. Higher levels of cardiac fibrosis in HIV, a known substrate for SAD in the general population, may underlie the mechanism by which HIV increases risk for SAD. Development of criteria and evaluation for implantable defibrillators in HIV should be carefully considered in the future as a means to prevent SAD in this high risk population. The underlying cause of increased cardiac fibrosis in HIV-infected persons is under investigation by this study group and will be the subject of a future publication.

#### Reference(s):

1. Zian H. Tseng, Jeffrey E. Olgin, Eric Vittinghoff, Philip C. Ursell, Anthony S. Kim, Karl Sporer, Clement Yeh, Benjamin Colburn, Nina M. Clark, Rana Khan, Amy P. Hart, and Ellen Moffatt. Prospective Countywide Surveillance and Autopsy Characterization of Sudden Cardiac Death. *Circulation* 137 (25) 2689-2700 June 2018.

#### Sudden Death, HIV, Autopsy