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Cardiac Devices Help Solve Forensic Cases

According to a study presented at EHRA EUROPACE-CARDIOSTIM 2017, pacemakers and other cardiac devices can help solve forensic cases. Devices have been able to reveal time and cause of death in some cases where autopsy failed to do the same.

Lead author Dr Philipp Lacour, a cardiologist at Charité - Medical University of Berlin, Germany explains that nearly 30% of cases remain unsolved because the cause or time of death after autopsy remains unclear. The use of implanted cardiac devices that have sophisticated diagnostic functions is on the rise. Device interrogation is not typically performed after autopsy but the researchers wanted to investigate whether interrogating them may help shed light on the unclear elements related to deaths.

Study researchers collaborated with the Department of Forensic Medicine at Charité - Medical University of Berlin. More than 5000 autopsies were performed in a five year period of which 150 had an implantable cardiac device. These devices included 107 pacemakers, 22 implantable cardioverter defibrillators (ICDs), 14 cardiac resynchronisation therapy (CRT) systems, and six implantable loop recorders. The devices were interrogated by two electrophysiologists to determine time and cause of death and device failure.

In 76% of cases, it was possible to determine the time of death from the device. The time could be identified precisely when the patient had tachycardia at the end of life. In other cases, the researchers used seven parameters to assign the time of death including lead impedance and pacing threshold. Dr. Lacour points out that lead impedance rises at the end of life due to changes in heart muscle and pacing.

In 24% of cases, it was possible to determine the cause of death. Common causes included bradycardia, tachycardia, ventricular fibrillation, and device malfunctions. Device malfunction occurred in 7% of cases including hardware failure, algorithm issues, or a programming issue.

Dr Lacour said: "In our study, the time or cause of death was unclear in about 30% of cases after autopsy alone. This dropped to around 10-20% using device interrogation. The two procedures provide complementary information and with the combination we can solve around 85% of all unclear deaths."

Dr Lacour believes that device interrogation should be routinely performed after autopsy in all forensic cases as it can help determine the time and cause of death as well as identify device malfunctions that may otherwise go unnoticed. He also suggests that the time between autopsy and device interrogation should be short as this will avoid the memory of the device from filling up with artefacts that can be generated once the leads are cut.

Source: ESC
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