Sudden cardiac death in psychiatric patients: for whom the bell tolls?

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Psychiatric patients, especially those with severe mental illnesses such as bipolar disorder or schizophrenia, have significantly shorter life expectancy and higher risk of sudden cardiac death (SCD) compared with the general population. For example, in a Danish retrospective cohort study including young patients from 2000 to 2006, the risk of SCD was increased fourfold in patients with psychiatric hospital contact.[1] In this issue of the *Heart*, Mujkanovic *et al* report the burden of SCD in an older Danish psychiatric population.[2] Based on International Classification of Diseases (ICD-10) codes from secondary care and the use of psychotropic medication, the authors determined the number of persons with a psychiatric disorder in 2010. Altogether, 17% of the Danish adult population fulfilled the criteria for psychiatric disease. They also reviewed death certificates of all the deceased and identified cases of SCD according to standard definitions. Of the 6002 SCD cases identified, 2319 had a psychiatric diagnosis or used psychotropic medication. After multivariable adjustment, psychiatric disorders were associated with a 2.3-fold risk of SCD and 13% of life years lost in this population were calculated to be caused by SCD. Of the different psychiatric diseases, schizophrenia had the highest SCD rates with an HR of 4.5.

We have known for a long time that patients with psychiatric disorders, especially those with more severe diseases, are more likely to exhibit poor health behaviours and cardiovascular risk factors. Especially those with schizophrenia may die young from either suicide or conditions such as coronary artery disease. Aetiology of increased cardiovascular risk is likely multifactorial and includes smoking, obesity, poor diet, sedentary lifestyle, diabetes, hypertension and hyperlipidaemia, together with adverse effects of antidepressant and antipsychotic medications, which may prolong cardiac repolarisation. Together, these factors may also contribute to the increased risk of SCD in these patients. Life expectancy

in people with schizophrenia is estimated to be 10–25 years less than in the general population. In young autopsy populations, patients with schizophrenia are 10-fold over-represented compared with their prevalence in the general population, coronary heart disease and non-ischemic cardiomyopathy being among the most common cardiac diseases responsible for SCD.[3] Patients with schizophrenia are also more likely to have unfavourable arrest-related factors such as lower rates of witnessed arrest and asystole as the presenting rhythm.[3]

The report by Mujkanovic *et al* significantly enhances our understanding of SCD risk within the vulnerable population of psychiatric patients. However, due to the study's design, the underlying mechanisms behind SCD remain largely speculative. The low autopsy rate of only 7% limits the ability to investigate underlying cardiac pathology or structural findings in myocardial tissue. For instance, myocardial fibrosis has been proposed as a risk factor for SCD,[4] and it would be insightful to determine whether this holds true in this particular population. Additionally, the limited number of toxicological analyses is noteworthy, as such data could be especially relevant in this context. Beyond the QT interval, novel sophisticated ECG parameters, such as variability of T-wave heterogeneity from the standard 12-lead ECG, have been associated with SCD.[5] Exploring whether psychotropic medications have affected various repolarisation parameters in this population, in addition to QT interval, could also be of interest.

So how can we predict and prevent SCD in patients with mental disorders? Since most sudden deaths are due to cardiovascular causes, identifying patients with elevated risk for cardiovascular events and intervening on the underlying risk factors such as smoking, hypertension, obesity, diabetes, dyslipidaemia and a sedentary lifestyle should be part of the solution. If symptoms suggestive of coronary artery disease, arrhythmias or heart failure would emerge, these should be investigated appropriately also in this group of patients. It is known that individuals with mental health conditions may be less likely to get treated according to guidelines even for established cardiovascular disease. For

example, a nationwide Finnish study on atrial fibrillation has demonstrated lower rates of oral anticoagulation initiation in patients with mental health condition.[6] As one potential solution to overcome this inequity is tailored behavioural counselling, care coordination and care management intervention in patients with serious mental illness, which has been demonstrated to significantly reduce cardiovascular disease risk in a randomised setting.[7]

In addition, 12-lead resting ECG should be recorded routinely in these patients to monitor the effect of psychotropic medication on the QT interval. Besides identifying patients with abnormal QTc prolongation, ECG may show signs of left ventricular hypertrophy, Q waves suggesting previous myocardial infarction or bundle branch block warranting further evaluation and treatment. Moreover, presence of multiple ECG abnormalities may identify subjects at increased risk of SCD.[8]

Survival rates from out-of-hospital cardiac arrest remain strikingly low despite efforts to increase the rates of bystander cardiopulmonary resuscitation and bystander defibrillation with automated external defibrillators. In the general population, SCD is preceded by symptoms in approximately half of the subjects. If these symptoms are not ignored but acted on promptly, this translates into fivefold increased survival after cardiac arrest.[9] The presence of symptoms before cardiac arrest may open a window of opportunity for *near-term prevention* of SCD. However, in psychiatric patients identifying and acting on cardiac symptoms may be even more difficult than in other groups of patients. Hopefully, in the not-so-distant future artificial intelligence together with wearable electronic devices may assist us in identifying high-risk patients and automatically detecting those experiencing sudden cardiac arrest enabling early defibrillation and resuscitation.

[Check for updates]

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► http://dx.doi.org/10.1136/heartjnl-2024-324092

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