

Out-of-hospital cardiac arrest: the importance of a registry

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Out-of-hospital cardiac arrest (OHCA) is the most time-critical and challenging medical emergency. Patient survival depends on a “strong chain of survival” requiring the community, call centres, ambulances, and hospitals working together. Early cardiopulmonary resuscitation (CPR) and defibrillation are crucial for successful outcomes. Despite improvements in early intervention, improved surveillance, and increased public awareness in recent decades, the overall survival rate of OHCA remains low. According to the United States data in 2017, 10.4% of OHCA patients survived to hospital discharge.¹ In Europe, 10.3% of OHCA patients survived for at least 30 days or to hospital discharge.² A study published in 2017 found that the figure for Hong Kong was even lower: only 2.3% of OHCA patients survived for at least 30 days or to hospital discharge.³ Furthermore, knowledge of automatic external defibrillator use and first aid training among the general public in Hong Kong are also low.⁴

Researchers and medical practitioners have long searched for better interventions that may prevent cardiac arrest or reduce the number of deaths. Preventive measures such as screening for high-risk groups and using implantable cardioverter-defibrillators are effective in the prevention of cardiac arrest. However, these measures are costly and there are procedural and long-term risks, such as infection and device or lead malfunction, which limit their use and coverage.⁵ Therefore, OHCA remains a challenge and initiatives aimed at optimising the quality and outcome of resuscitation are important. The Resuscitation Academy of the United States⁶ has published numerous initiatives to improve OHCA survival, among which setting up a Cardiac Arrest Registry was considered as the first step for continuous quality improvement.

In 2015, the Institute of Medicine published a report titled *Strategies to Improve Cardiac Arrest Survival: A Time to Act*⁷ that emphasised the significance of establishing a National Cardiac Arrest Registry as the first recommendation out of eight. In this issue of the *Hong Kong Medical Journal*, Lui et al⁸ review OHCA registries worldwide and discuss the urgent need for a territory-wide registry for OHCA. They argue that setting up such a registry is a critical step to improve the outcomes of OHCA in

Hong Kong as it enables data-driven assessment of the process and outcomes of OHCA management. Through ongoing and systematic collection of high-quality data, improvement efforts can be tracked, benchmarked, and refined.⁹ Data collected through an OHCA registry could enable high-quality research to identify areas for improvement that would strengthen the chain of survival.^{10,11} However, effective implementation can be challenging. The government plays a crucial role in assembling resources, infrastructure, and personnel that will be required to successfully establish, implement and sustain an OHCA registry. It may be practical to set up a government-led committee to govern and manage the registry. Emergency medical services personnel and healthcare workers would be ideally placed to oversee the overall operation of the registry and ensure consistent data contributions.

Data collected through an OHCA registry can be used for analysis and for planning improvements. In addition, these data can reveal controversial aspects of cardiac arrest. Also in this issue of the *Hong Kong Medical Journal*, So et al¹² discuss the difficulties of making a declaration of medical futility and a decision on termination of resuscitation (TOR). The decision of TOR is difficult to make but it can help reduce futile medical care of OHCA patients.¹³

Despite researchers working hard to refine the guidelines for TOR best practice, the discussion over when to stop resuscitation remains controversial. Clinical judgement will always be critical in deciding TOR timing; however, surveillance data from an OHCA registry can provide more objective figures for medical researchers to analyse and establish better guidelines for TOR. It is extremely important that TOR guidelines are regularly updated with the latest surveillance data analysis and advances in medical technology.

An OHCA registry is a fundamental source of data for cardiac arrest and a cornerstone for understanding the current OHCA burden as well as for designing effective improvement plans. Potential roles for an OHCA registry extend far beyond epidemiological research, from deployment of resources to health economics, from the evaluation of bystander CPR to monitoring the OHCA outcomes, and from outcome improvement to the development of guidelines. Despite efforts

by researchers and medical professionals to uphold the current standards, the survival rate of OHCA in Hong Kong remains very low. Hong Kong has already implemented successful policies on protection of rescuers and public access to defibrillators.^{14,15} Given the successful experiences from nearby countries such as Japan and Singapore that have introduced OHCA registries,¹⁶⁻¹⁸ it is of pressing need to establish such a territory-wide OHCA registry in Hong Kong.

Author contributions

The author contributed to the study, approved the final version for publication, and takes responsibility for its accuracy and integrity.

Conflicts of interest

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