ILCOR 10 Steps to improve IHCA – The IHCA registry in a Chinese Hospital

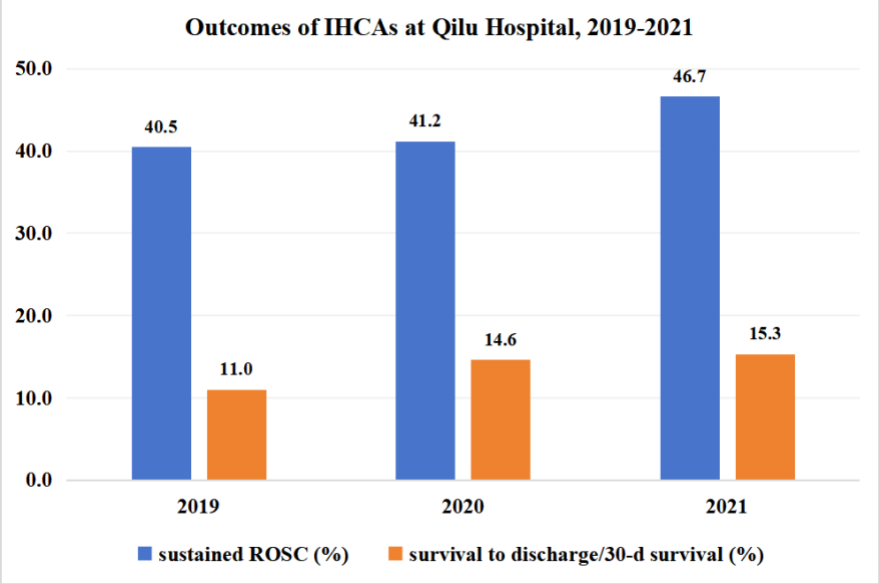
Background: It is a significant challenge to capture hospital-wide IHCA events continuously and collect key variables recommended by the Utstein template, especially in low-resource settings. It requires a certain level of medical information, necessary investment in human resources, and specific triggering mechanisms for identifying targeted patients (i.e., ways for investigators to get the information when IHCA occurs, either by RRT code, or periodic retrospective screening on certain medical orders), and systematic quality control and feedback mechanisms for the data [1]. Addressing these issues needs improvements tailored to each hospital's specific situation, with the ultimate goal of continuous, complete, and accurate data collection.

Steps Taken

- Qilu Hospital of Shandong University is one of the earliest hospitals in mainland China to start a standardized cardiac arrest registry and is the coordinating center of the BASIC study, which is the first national registry on cardiac arrest in China, which consistently enrolled IHCA cases since 2019.
- In the initial phase, the screening of IHCA cases consisted of two steps. The first was to identify the list of patients who may have IHCA by screening specific medical orders (such as cardiopulmonary resuscitation, epinephrine, etc.) in the HIS. Secondly, the researchers manually reviewed the medical records from the list one by one to identify confirmed IHCAs. This process was very labor-intensive, and due to the passive extraction of medical records, many key variables of Utstein were not completely and accurately recorded by providers, resulting in missing data. However, this process was essential to understand the problems, and to promote the implementation of improvements.
- To reduce the manual screening effort, achieve real-time inclusion of the target cases, and complete capture of key elements, several measures have been taken.
  1) Through the Department of Medical Administration, healthcare providers are required to give standardized medical orders of CPR and defibrillation immediately after resuscitation.
  2) Under the premise of not affecting the routine work of the HIS, a small program is embedded in the system. As long as the standardized order is issued, the program will automatically send a short message to the investigator, indicating the occurrence of the event, to enroll the case as soon as possible.
  3) Special training has been conducted for medical staff, including treatment procedures following guidelines, standardized writing of rescue records (covering key variables), and issuing standardized medical orders.
  4) Close communication is formed between investigators and medical staff for continuous feedback and improvement.
- Through this series of initiatives, the majority of IHCAs in this hospital got standardized medical orders, and it enables us to achieve real-time capture of IHCAs for prospective registration. More importantly, healthcare providers have significantly increased their focus on cardiac arrest patients and have gained a deeper understanding of the core elements of the resuscitation process, such as how and when to intervene to optimize the quality of care and patient survival.

Challenges: Because of the heavy clinical business undertaken by HIS and the unacceptable stagnation, it is risky to insert additional functions into the system. This requires adequate communication and consultation between cardiac arrest investigators and data engineers in the Information Department to choose whether and how to set the trigger mechanism, depending on the specifics of the system. It is even more difficult to change the work habits of medical staff, especially physicians in the emergency department and intensive care units who are already overworked. Therefore, the information required for registration should be closely linked to their routine work; standardized writing of medical records should be simple and easy, as templates are provided so that physiscians only need to add, delete, and change them according to the situation; standardized medical orders should be concise. In addition, administrative power is also necessary, and management support and ongoing supervision are important.

Results: Prospective and continuous registration of cardiac arrest cases was achieved in Qilu Hospital, capturing more accurate information about the process of care (e.g., interventions, timing, etc.) and outcomes. Awareness and attention to cardiac arrest increased among all healthcare providers, which improved patient outcomes significantly. From 2019 to 2021, the sustained ROSC increased from 40.5% to 46.7%, while the survival to discharge/30-day survival increased from 11.0% to 15.3% (Figure).



Outlook: Through the registry, we fully understand the incidence, implementation of the chain of survival, and patient outcomes of IHCA in our hospital, which has important guiding significance for the scientific allocation of medical resources such as defibrillators and ventilators, as well as training of medical staff in BLS, ALS, and other aspects. In the future, Qilu Hospital of Shandong University will also promote the experience and model of registration to more hospitals, so that more patients can benefit.

Reference: [1] Wang C, Zheng W, Zheng J, et al. A national effort to improve outcomes for in-hospital cardiac arrest in China: The BASeline Investigation of Cardiac Arrest (BASIC-IHCA). Resusc Plus 2022;11:100259. DOI: 10.1016/j.resplu.2022.100259.

Contact information: Feng Xu (xufengsdu@126.com); Wen Zheng, Chunyi Wang, Jiaqi Zheng, Yuguo Chen. Department of Emergency Medicine, Shandong Provincial Clinical Research Center for Emergency and Critical Care Medicine, Qilu Hospital of Shandong University, Ji'nan, China