

Stopped hearts need more research to start: Review shows lack of cardiac arrest studies

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Cardiac arrest kills 90 percent of the people it strikes, but very few "gold standard" clinical trials have been done to determine how best to change that. Credit: University of Michigan

Hundreds of thousands of times a year in this country, a heart stops suddenly, when the electrical signals that keep it beating go tragically haywire.

It's called a [cardiac arrest](#), and only one in 10 people survive it, whether it happens on a city street, a golf course or a hospital floor.

But despite the fact that cardiac arrest kills ten times more people than breast cancer, new research shows a huge lack of studies aimed at improving care and survival.

Over the last 20 years, a University of Michigan-led team found, only 92 gold-standard clinical trials have been done on the immediate treatment of cardiac arrest. They report their results, which are based on an exhaustive review of the medical literature, in a paper published online in *Circulation: Cardiovascular Quality and Outcomes*.

The randomized clinical trials that have been done on cardiac arrest involved just over 64,000 patients. Less than five studies a year have published their results.

And most tested drugs and devices rather than ways to improve the system of caring for cardiac arrest, from bystanders to ambulance crews to hospitals.

"What we found in a nutshell was a striking paucity of [randomized clinical trials](#) relative to the burden of cardiac arrest in this country," says Shashank S. Sinha, M.D., M.Sc., a cardiovascular medicine fellow at the U-M Medical School. "We estimate that only 2.5 such trials have been done for every 10,000 out-of-hospital cardiac arrests, and the number is even lower for in-hospital cardiac arrests."

By comparison, he says, each year there are 25 to 86 times more clinical trials published for heart failure, heart attack and stroke than for cardiac arrest.

About the study

Sinha performed the study with U-M co-authors who include Brahmajee K. Nallamothu, M.D., M.P.H., a member of an Institute of Medicine panel that called for action on cardiac arrest, and Robert W. Neumar, M.D., Ph.D., the chair of the American Heart Association's emergency heart care committee who helped create new cardiac arrest treatment guidelines.

A colleague from the Mid America Heart Institute, Paul S. Chan, M.D., M.Sc., also contributed. Chan is also Chair of Science for the American Heart Association's Get With The Guidelines-Resuscitation registry for in-hospital cardiac arrest.

The review did find that the pace of trials on cardiac arrest has picked up in the last five years, a hopeful sign that more can be done. The researchers evaluated more than 5,000 published medical journal articles and abstracts, but most did not meet the standard needed to draw specific conclusions about the effectiveness of treatment options.

"Cardiac arrests remain a significant public health need worldwide, and the limited progress in improving poor survival in the U.S. and globally may be due to inadequate research," says Sinha. "We need to move the needle."

He notes that the recent IOM report, and the AHA's recent update to guidelines for cardiopulmonary resuscitation (CPR) and emergency cardiac care, appear to be building momentum for further action on cardiac arrest.

Compelling opportunities

The new paper spotlights areas where research on cardiac arrest is most lacking, including protocols for emergency care, post-arrest care, and

studies of long-term survival and functional outcomes.

Many of the trials highlighted only followed patients through the return of spontaneous circulation, or the restarting of normal heart rhythm. Some studied whether the patients survived long enough to be discharged from the hospital. But what happens to survivors after that, for the days, months and years that follow, is largely unstudied.

Another potential area for research to improve cardiac arrest care is standardizing how researchers measure the outcomes of care, including patient-centered things like returning to work or having a reasonable quality of life.

Sinha notes that most of the best studies on cardiac arrest have been done outside the U.S. - suggesting a major opportunity for funding agencies and organizations to support new trials.

While new drugs and automated CPR devices used while a cardiac arrest is under way should be studied, he says, there's a "compelling opportunity" to study immediate post-arrest care.

Better research on processes of care, which could lead to standardization and even accreditation of hospital care, is sorely needed, he says. Perhaps one day, cardiac arrest care could reach the place that heart attack care already has.

The new review did not include studies of public-health interventions such as installation of automated external defibrillators or AEDs. It also excluded studies on infants and children.

More information: Shashank S. Sinha et al, Identifying Important Gaps in Randomized Controlled Trials of Adult Cardiac Arrest Treatments, *Circulation: Cardiovascular Quality and Outcomes* (2016).

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