Implantable Defibrillators Lead to Decrease in Cardiac Arrests

Circulation

DALLAS (GLOBE NEWSWIRE) -- Implantable cardioverter defibrillators account for one-third of the decrease in cardiac arrests caused by ventricular fibrillation in North-Holland, according to research in Circulation, an American Heart Association journal.

VF is an abnormal heart rhythm that makes the heart quiver so it can't pump blood.

ICDs are small electronic devices implanted in the chest that detect potentially fatal abnormal heart rhythms and try to stop them with electric shocks. Generally, only people with a high risk of sudden cardiac death -- mostly those at high risk of abnormal heartbeats and survivors of a previous cardiac arrest -- receive ICDs.

Previous studies have shown a gradual 15-year decrease in VF-related cardiac arrests suffered outside the hospital setting -- from 54 percent to 38 percent in the United States and Europe. However, the incidence of such cardiac arrests from other abnormal heart rhythms continues to increase each year.

Researchers estimated that ICDs prevented 81 cardiac arrests during the 2005-2008 study. To reach this estimate, they multiplied the number of life-threatening abnormal heart rhythms stopped by an ICD by the probability that the rhythm would have led to a call to emergency medical services (EMS) and a resuscitation attempt.

They assumed that a life-threatening abnormal heart rhythm would prompt calls to EMS in 62 percent of cases, and an attempt at resuscitation would occur in 67 percent of those people.

"At least one in 20 ICD carriers can expect a life-saving shock from their device each year," said Rudolph W. Koster, M.D., Ph.D., senior author and associate professor of cardiology at the Academic Medical Center in Amsterdam, The Netherlands.

Researchers used data from the Amsterdam Resuscitation Studies registry of cardiac resuscitations by EMS in the greater Amsterdam area in 1995-1997, and all EMS cardiac arrest interventions in the area in 2005-2008.

Focusing on people known to have VF when EMS arrived, researchers found:

- An estimated 339 shocks successfully stopped 194 instances of life-threatening abnormal heart rhythms in 166 people.

- The percentage of patients with VF cardiac arrest fell from 63 percent in 1995-1997 to 47 percent in 2005-2008.
- The annual incidence of VF cardiac arrests fell significantly, from 21.1 people per 100,000 to 17.4 people per 100,000.
- Incidence of cardiac arrests related to other abnormal rhythms increased significantly, from 12.2 per 100,000 to 19.4 per 100,000 annually.

It's unknown what caused the other two-thirds of decline in VF arrests or why cardiac arrests vs. other abnormal heart rhythms have increased.

"The possible mechanisms are only guesses without much solid evidence," Koster said.

It's likely that western countries that implant ICDs for similar indications would see a similar reduction in out-of-hospital cardiac arrest from ventricular fibrillation, he said.

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