ARRHYTHMIAS

Widespread use of public-access AEDs improves survival after cardiac arrest

The nationwide distribution of public-access automated external defibrillators (AEDs) increases the use of these devices by individuals who witness an out-of-hospital sudden cardiac arrest, and improves neurological outcome or survival with minimal neurological impairment among patients who receive an AED shock. These findings from a prospective, population-based study conducted by the Fire and Disaster Management Agency of Japan have far-reaching implications.

Since the legalization of AED use by untrained laypersons in Japan in 2004, the number of AEDs located in public areas, such as schools, work places, and sports, social, and transportation facilities, has increased nearly ninefold.

Tetsuhisa Kitamura and colleagues have investigated the effects of this increased distribution of AEDs on the outcomes of patients aged 18 years or older who experienced an out-of-hospital cardiac arrest in Japan between 1 January 2005 and 31 December 2007. During the study period, a total of 312,319 cardiac arrests occurred; 12,631 of these events were witnessed and the patients found to be in ventricular fibrillation. Among the 462 individuals who received a shock from a public-access AED before the

arrival of the emergency medical services, 31.6% survived to 1 month with minimal neurological impairment. By contrast, 14.0% of the 11,697 patients who received a first shock from emergency service personnel, and 6.8% of the 472 individuals who received no shock, were alive with minimal neurological impairment 1 month after their cardiac arrest.

In line with the increasing number of public-access AEDs available, the number of patients receiving a first shock from a public-access AED increased over time—from 45 in 2005 to 274 in 2007—as did the survival rate for these patients—from 24.4% in 2005 to 41.6% in 2007. The incidence of bystander-initiated cardiopulmonary resuscitation (CPR) also increased during the study period. The increase in survival afforded by CPR was not influenced by the method used (conventional CPR or chest-compression only). Finally, the mean time from cardiac arrest to first shock with a public-access AED or initiation of CPR, by laypersons or emergency medical service personnel, also decreased over time (from 3.6 min or 6.5 min in 2005 to 2.9 min or 5.7 min in 2007, respectively).

“I think our findings could apply in many other industrialized countries where sudden cardiac arrest is a major

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public health problem, such as the US and European countries” says researcher Taku Iwami. “We think it is very important, not only to disseminate public-access AEDs, but also to train people to be able to use [them]. We [have] started to disseminate a simplified CPR training program ... to increase bystander CPR and AED use in selected areas in Japan.”

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