Stayin' alive—delivering resuscitation messages to the public

March 22 2013

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Teaching bystander Cardiac Pulmonary Resuscitation (CPR) strategically to the general public offers the greatest potential to make the biggest overall impact on survival in out of hospital cardiac arrests in Europe, reported a main session on Resuscitation Science at the European Society of Cardiology's EuroHeart Care Congress, which took place in Glasgow, 22 to 23 March, 2013.

"The reality is that four out of five cardiac arrests happen at home, and unless the public are trained in resuscitation many people die before emergency services get to them," said Mary Hannon. "The good news is that CPR is an important life saving technique that can be effectively taught to most people."

The European Resuscitation Council estimates that around 500,000 people suffer a sudden cardiac arrest every year in Europe. While bystander CPR increases survival rates by two to three times, it however is only delivered in one in five out of hospital cardiac arrests. Optimizing this rate, the European Resuscitation Council has estimated, could save 100,000 lives in Europe each year.

"We want to get the message across that anyone, whether First Aid trained or untrained can help someone in an emergency and that doing

something is better than not doing anything at all," said Hannon.

It is estimated that a victim's chance of survival slips away by 7% to 10% each minute before CPR is started. "So it's vital not to procrastinate. The challenge is to persuade everyone to roll up their sleeves and get stuck in as quickly as possible," she said.

While in emergency situations everyone should be prepared to have a go, studies have suggested that people who have formally learnt CPR are ten times more likely to respond than those who have not. And training makes a big difference to survival. Statistics from the American Heart Foundation show that in cities such as Seattle and Washington where CPR training is widespread, the survival rate for cardiac arrest is around 30%, where as in cities such a New York city, were training is less, survival rates averages 1-2%.

Ireland's CPR success story

In her presentation Hannon, who works as Resuscitation Training Officer at the Connolly Hospital Blanchardstown (CHB), Dublin, described Ireland's success story, where the "National First Responders campaign" set out to teach resuscitation to the general public.

The campaign, launched in 2005, was a joint initiative from The Irish Heart Foundation (IHF), Pre Hospital Emergency Care Council (PHEC), National Ambulance Service (NAS), and others. The initiative, which involved integrations of the statutory and voluntary services, aimed to train as many people from the community as possible in bystander CPR. In the campaign the Heart Saver AED course was taken out into the community, with members of the public taught the basic techniques of CPR, how to use an automated external defibrillator (AED) and the relief of choking for adults, children and infants.

Overall 65,000 people are now trained in CPR annually in Southern Ireland, and the campaign has resulted in the number of people surviving out of hospital cardiac arrests in Southern Ireland rising from just 1% in 2005, to 6.5% in 2012.

Perhaps the most innovative part of the programme was the introduction of CPR training into the school curriculum. In the "CPR 4 Schools Programme", which ran in 2009, all Transition Year students (aged 16 years), amounting to around 27000 people, were issued with self training kits containing a DVD, booklet and inflatable manikin, which together create and easy to follow lesson in CPR. Teachers acted as facilitators to the training, rather than instructors.

In an evaluation of the programme, 76% of school children who took part said that they would be likely to give CPR if they were present when a person collapse; 90% felt more confident to perform CPR after training; and 68% said they would show their family and friends how to do CPR.

"We showed that by targeting school children there was a real potential that they'll take the knowledge home and teach the rest of the family," said Hannon.

Although the initiative was unfortunately discontinued due to monetary constraints, she said, some schools have continued, and there are future plans to incorporate CPR into the school curriculum.

Future moves to establish a registry of automatic external defibrillators (AEDs) in Southern Ireland, she said, should further increase survival. "Once we know exactly where defibrillators are based we hope to link them to the ambulance services so that lay rescuers can be contacted to take them directly to the victim," said Hannon. An additional advantage, she added, would be that such knowledge would enable strategies to be

put in place to ensure good maintenance of the devices.

Can music help achieve the correct rate and depth in CPR?

One of the big challenges in CPR has been to train members of the public and health care professional to achieve the correct rate and depth of chest compressions. In the session Dr Lettie Rawlins gave an overview of the research she undertook at Coventry University, while a medical student, using music as a prompt to help people achieve the correct tempo of chest compressions.

"It's really important to use the correct amount of force to compress the heart sufficiently to push the blood out, and at the same time you need the correct rate of compressions to enable sufficient blood to reach the brain," said Rawlins, now a junior doctor at the Great Western Hospital, Swindon, UK.

"It's quite difficult to get the right rate even if someone shows you, and really easy to deskill if you haven't practiced for a while. The idea behind using popular music is that songs stay longer in your head," she said.

In a study published in the *BMJ* in 2009, Rawlins and colleagues showed that using "Nellie the Elephant" as background music significantly increased the number of people getting the right rate of compressions on a manikin, but that there was a drop in those hitting the correct depth.

A second study, published in the *Emergency Medical Journal* in 2012, found that the proportion of paramedics who maintained compressions within the optimal range of 100 to 120 a minute was significantly higher when listening to "Disco Science" by Mirwais (82%) than when listening

to "Achy Breaky Heart" by Billy Ray Cyrus (64%) or no music at all (65%). But over a third of compressions were still too shallow, irrespective of the music used. "We found that "Achy Breaky Heart" was actually harmful because it made people compress too fast, so that the heart didn't have a chance to fill properly," said Rawlins. They did not, however, investigate "Stayin' Alive", by the Bee Gees, which the British Heart Foundation used in their 2012 "Hard and Fast" ad campaign.

At the end of the studies the investigators remained unconvinced that music provided any additional benefits in improving the quality of CPR compared with using a metronome. "We think the problem may be that music distracted people from focusing on the force of the compressions," explained Rawlins. In future, she said, it might be more effective to develop manikins with sensors for pressure and rate that could be attached to Wii Fit type devices to deliver real time feedback, and also to have smart phone aps that could be used to provide a metronome in emergency situations.

More information: L Rawlins, M Woollard, J Williams, et al. Effect of listening to Nellie the Elephant during CPR training on performance of chest compressions by lay people: randomized crossover trial. *BMJ* 2009; 339:b4707.

Provided by European Society of Cardiology