

Fra: sendarticle@theheart.org [<mailto:sendarticle@theheart.org>]

Sendt: 7. januar 2006 10:43

Surprises in largest ever in-hospital cardiac arrest study

Surprises in largest ever in-hospital cardiac arrest study

Jan 4, 2006

Lisa Nainggolan

Philadelphia, PA - The largest ever study of in-hospital cardiac arrests challenges the prevailing medical opinion about the patterns and causes of these life-threatening events [1]. Reporting their findings in the January 4, 2006 issue of the Journal of the American Medical Association, Dr Vinay M Nadkarni (University of Pennsylvania School of Medicine, Philadelphia) and colleagues from the National Registry of Cardiopulmonary Resuscitation found that the majority of in-hospital cardiac arrests are caused by progressive respiratory failure and shock, not by a sudden arrhythmia.

They also found that there was more similarity between adult and pediatric cardiac arrest than has previously been appreciated by doctors. "We found that you cannot simply categorize patients on the basis of age," Nadkarni told heartwire. "Our results suggest that hospital caregivers need to carefully tailor their resuscitations to a patient's situation and not to follow a blanket protocol based only on the patient's age."

In an accompanying editorial [2], Dr Linda Quan (University of Washington School of Medicine, Children's Hospital, Seattle) agrees. "The results of Nadkarni et al raise the issue of whether approaches for pediatric and adult resuscitation should differ."

Three quarters of adults have respiratory failure, not VF

Nadkarni et al collected data on almost 37 000 cardiac arrests in adults and 880 in children from 253 hospitals in the US and Canada. "This is the first large representative registry study of this subject," says Nadkarni. "It describes the landscape, process of care, and outcomes of in-hospital cardiac arrest in North America."

The main outcome measure—rate of survival to hospital discharge following pulseless cardiac arrest—was higher in children than in adults (27% vs 18%, adjusted odds ratio 2.29). This was predominantly because of better outcomes in children following asystole and pulseless electrical activity.

But even this finding is "better for adults than the 10% to 15% survival normally quoted by physicians," says Nadkarni. "I think these results show that outcomes following in-hospital cardiac arrest are much worse than the lay public's perception, because of the way the CPR [cardiopulmonary resuscitation] outcomes are represented in the TV shows they watch, but better than the doctor's dark view of the outcome of cardiac arrest. Physicians are sometimes too quick to stop resuscitation because they believe outcomes are so poor." Most of the pediatric and adult survivors also had good neurological outcomes (65% and 73%, respectively).

In the hospital, the first rhythm that's detected is . . . more likely to be asystole. This is the first time there has been an appreciation of this on a large scale.

One of the most important findings of the study, Nadkarni told heartwire, is that 75% of adults experiencing cardiac arrest actually have progressive respiratory failure and go into shock as a precipitating cause, rather than the ventricular fibrillation (VF) that most doctors believed they were experiencing. The perception is, "if only we could defibrillate faster and better, we'd have better outcomes," he says. "But we found that in the hospital, the first rhythm that's detected is not VF or

pulseless ventricular tachycardia (VT), it's more likely to be asystole rhythm that will not respond to shock. This is the first time there has been an appreciation of this on a large scale."

"In adults with sudden cardiac arrest, there is a good resuscitation rate in those suffering VF, but it's very poor in those not suffering VF," he adds. "So maybe we need to shift our treatment to focus more toward respiratory failure and shock in adults. We are enthralled with early defibrillation but, in fact, it is only pertinent in one quarter of the adult patients. The focusing and sequencing of therapy needs to be thoughtfully applied."

We are enthralled with early defibrillation but, in fact, it is only pertinent in one quarter of the adult patients.

Nadkarni says the results of the registry were available to the committees updating the guidelines for the resuscitation of adults and children in the US, Europe, and elsewhere at the end of last year. The most significant changes were to advise fewer interruptions to chest compressions, an increase in the chest-compression-to-ventilation ratio, a change in the way compressions and defibrillation are used together, and improvement in the quality of CPR. "We made the changes to put the emphasis back on minimally interrupted chest compressions," he told heartwire. "If you are frequently interrupting compressions to assess rhythms, this is not good. You need to get on with compressions."

Nadkarni says he believes the key to successful resuscitation is the immediate restoration of a pulse, increasing blood flow and oxygenation, "which is mostly done through compressions. Once you have good oxygenation, then the paths of treatment can differ, depending on the underlying condition."

Children suffer more VF than previously thought

Nadkarni says the study also turned up some surprises when it came to pediatric patients. "It was previously thought that kids rarely suffered VF or VT," but the registry data show this is not true and that a quarter of all the pediatric patients exhibited shockable rhythms."

"The focus previously was to rescue breathing in children, but we found that children will respond to adults types of treatment (ie, defibrillation). What was previously assumed to be unusual or uncommon is not. The early recognition of VT or VF in kids is going to be important."

In her editorial, Quan acknowledges this. "The pediatric patient usually does not have the benefit of early recognition of VF that an AED [automatic external defibrillator] can provide because AEDs are less commonly used in pediatric hospital settings." Also, even when the need for pediatric defibrillation is recognized, it is "problematic," she notes. "Requirements for different defibrillator paddle sizes, chest placement, and energy dosing can contribute to delay." She says rapid response teams, AEDs, or both with pediatric capabilities that result in quicker defibrillation "might result in pediatric VF outcomes surpassing those of adult patients with VF."

Nadkarni told heartwire that the way children are treated for cardiac arrest currently differs, depending on whether kids are in a children's hospital or a mixed hospital, and that in the future his team hopes to look at adolescents aged 12 to 18 who tend to be "overlap" patients. "They are sometimes treated in children's hospitals and sometimes in adult hospitals, so it will be interesting to see if there is a difference in outcome depending on whether they are treated."

Is it time for a universal approach?

What is good for the goose is good for the gosling.

In conclusion, Quan says, "although the underlying diseases and degrees of illness are very different for adult and pediatric patients with cardiac arrest, the tenets of care appear to be the same. The two pillars of

wisdom, CPR and defibrillation, are intertwined, interlocked, and now ageless. The pediatric and adult in-hospital and out-of-hospital chain of survival appear one and the same."

"What a great relief it would be to say to those individuals involved in resuscitation care, regardless of the arrested patient's age and setting, that there is a universal approach. What is good for the goose is good for the gosling."

1. Nadkarni VM, Larkin GL, Peberdy MA, et al. First documented rhythm and clinical outcome form in-hospital cardiac arrest among children and adults. JAMA 2006; 295: 50-57.
2. Quan L. Adult and pediatric resuscitation. Finding common ground. JAMA 2006; 295:96-98.