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Editorial

Chest-compression-only after drowning: a call for more research



Every now and again a publication appears that challenges long-held beliefs: that by Fukunda et al. from Japan, published in the current issue of *Resuscitation*, is surely one such.¹ The authors' conclusion, from a large observational study of cases of drowning, is that there was no difference in the one-month neurologically-favourable survival between those victims who received bystander-initiated conventional CPR and those who received compression-only CPR.

Since the initial *Advisory Statements* from the International Liaison Committee on Resuscitation (ILCOR),² drowning has been considered a "special circumstance" requiring some variation from standard adult CPR. Because drowning produces an asphyxial rather than a primary cardiac arrest, emphasis has been put on the need for early ventilation. Whilst the subsequent guidelines for adult basic life support (BLS) continued to advise starting resuscitation with rescue breaths, only minor differences were needed for drowning victims, such as giving 5 initial breaths and performing resuscitation for about 1 min before going for help. It also meant that the same algorithm could be used for drowning as for paediatric BLS.^{3–4}

From 2005 onwards, however, the standard adult BLS algorithm changed to 30 initial chest compressions followed by 2 rescue breaths,⁵ reflecting the recognition that most cardiac arrests are due to a cardiac cause and chest compressions are of primary importance. In parallel with this came publications suggesting that chest compressions alone were at least as effective as combined compression and ventilation in most cases of adult cardiac arrest.^{6–9} This created a problem for those responsible for advising on resuscitation following drowning, as compression-first was not consistent with the need urgently to ventilate a hypoxic victim. Several publications appeared, emphasising this need and calling for more recognition of drowning as requiring specific attention and management.^{10–12}

The latest (2015) European Resuscitation Council guidelines still recommend combined compression and ventilation for all cases of cardiac arrest,¹³ but recognise that the far simpler chest-compression-only is an effective alternative for dispatcher-directed (telephone) CPR. Dispatchers are advised to offer compression-only CPR for untrained rescuers in all cases of cardiac arrest except children, when instruction on rescue breaths should be given as well. Surprisingly, drowning is not included as a similar exception, implying that dispatchers should offer compression-only CPR. The guidelines do contain a much-expanded section on water rescue and drowning, including a unique

treatment algorithm, but this is specifically for rescuers with a duty to respond.¹⁴ But what about the bystander without such a duty? Fukunda et al. suggest that it is, in fact, reasonable, for dispatchers to offer compression-only CPR.

In spite of the fact there has not been any previous randomised clinical trial, or even observational study of conventional versus compression-only CPR following drowning,¹ experts in the field have argued that there is, *a priori*, a case for combined ventilation and compression based on the fact that drowning is an asphyxial event.^{10–12} A Devil's Advocate*,¹⁵ however, could argue that there is a good case for considering the results of this new study as a call for further research, because:

- dispatcher- and mass-teaching of compression-only CPR has been shown to improve overall results from out-of-hospital bystander resuscitation.¹⁶ Might this not also be the case for drowning itself?
- by no means every victim of cardiac arrest in the water has suffered primary drowning.¹⁷
- at least in developed countries, cardiac causes of cardiac arrest are much more common than drowning: the principle of '*the greatest good for the greatest number*' should, therefore, apply.¹⁸
- even if standard CPR (with ventilation) is the management of choice for drowning victims, surely it is better for the untrained rescuer to be instructed to do something simple than to be unable to do anything?

Fukunda et al., quite rightly, admit that there are weaknesses in their study, mainly related to a lack of data on specific features of drowning, such as water temperature, submersion duration, and body of water. These data are not included in reports according to Utstein reporting of out-of-hospital cardiac arrest¹⁹ although they are in the Utstein-style reporting for drowning.²⁰ In addition, both reporting styles only ask whether or not bystander CPR included rescue breathing as subset or supplementary information. Future retrospective researchers will have no choice but to use what data exist, but prospective studies should be designed to avoid these deficiencies.

We are about a year away from a 5-yearly review of the resuscitation guidelines, and already working groups are reviewing current literature. This paper will undoubtedly be of interest. How might it change the management of drowning? Probably very little, particularly for rescuers with a duty of care. It does seem a little strange that guidelines for

dispatcher-directed CPR after drowning are currently compression-only; it is even possible that this was an oversight. The results of the present study, however, suggest that the advice may, in fact, be correct. The appropriate working group should take Fukuda and colleagues' research into consideration when reviewing the section.

We have been set a challenge! In this day of evidence-based medicine, we need to be open to all ideas that could possibly result in a significant change in our practice of resuscitation medicine. Who will be first to try and replicate these database results?

*Devil's Advocate is someone who takes a position they do not necessarily agree with for the sake of debate or to explore the thought further.

Conflict of interest statement

The author holds honorary (unpaid) roles in the European Resuscitation Council, Resuscitation Council (UK) and Royal Life Saving Society UK.

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