



Letter to the Editor

Quality of cardiopulmonary resuscitation by lifeguards on a small inflatable boat

Sir,

Drowning is a common cause of accidental death in many areas of the world.¹ Resuscitation after drowning must consider its special circumstances² but due to the relative lack of evidences, the European Resuscitation Council (ERC) has acknowledged the need of further research on the subject.² Recently, a “drowning chain of survival” has been generated by experts, but the model still needs to be tested in aquatic scenarios.³ 2010 ERC guidelines recommend to “remove all drowning victims from the water by the fastest and safest means available and resuscitate as quickly as possible”, because “the first and most important treatment for the drowning victim is alleviation of hypoxemia” and to “give five initial ventilations/rescue as soon as possible”.² Following such guide in victims drowned at sea, cardiopulmonary resuscitation (CPR) should be started on scene as soon as the victim is taken on board.

We have tested in a manikin model the quality of CPR (Q-CPR) performed by 31 beach lifeguards on a small inflatable rescue boat (IRB). Tests were carried out at a beach in north-west of Spain, with calm water and no wind. They were asked to deliver 2 min basic CPR on Resusci-Anne[®] manikins, first on land and then on board 100 m offshore on the IRB. Q-CPR was measured by Wireless Skillreporter[®] on land and with Q-CPR meter[®] (both by Laerdal, Norway) and video recording on boat.

On land, subjects performed better than on board (Table 1). Anyway, on board Q-CPR was quite good: mean CC rate 101.4% of recommended upper limit (120 CC/min) and mean CC depth 96.0% of recommended lower limit (50 mm).

After drowning the duration of hypoxia is the most critical outcome factor; therefore, immediate resuscitation at scene is essential to provide oxygenation, ventilation, and perfusion.^{1,2} When drowning occurs at beach but off shore, lifeguards must retrieve the victim and decide if the priority is to take the victim to shore or to start immediately CPR on-board. Limited evidences are available to support or refute one or other decision.^{1,4} We observed that lifeguards are able to deliver very good Q-CPR on manikins on land^{2,5}; when they had to perform CPR on a manikin on a still small IRB on calm water, their performance was lower than on land but comparable with the results reported by other with manikins on land or during transport. Therefore we consider that in some cases (e.g. if multiple victims or long distance to shore), immediate on-board CPR can be done with enough CPR quality and we suggest that a short period (e.g. 2 min) of on-board resuscitation might be useful and not a waste of time because during this time the land team could be displayed to be ready to continue CPR when the victim is taken to shore.

Table 1Comparison of cardiopulmonary resuscitation quality at beach on land vs. on board. Mean \pm standard deviation.

Variable	On land	On board	<i>p</i>
Number of rescue effective ventilations	4.7 \pm 0.6	2.4 \pm 1.7	<0.001
Chest compressions (CC)			
Rate (CC/min)	105.5 \pm 7.1	121.7 \pm 9.4	<0.001
Mean depth (mm)	55.1 \pm 4.1	48.4 \pm 4.2	<0.001
% of full correct CC	62.4 \pm 26.6	35.0 \pm 16.9	<0.001
% shallow CC	13.4 \pm 22.0	61.5 \pm 19.9	<0.001
% excessive depth	24.1 \pm 28.5	3.4 \pm 3.9	<0.001
% correct re-expansion	77.6 \pm 23.8	34.0 \pm 30.8	<0.001
% correct hand position	97.4 \pm 13.8	100 \pm 0	0.307

In conclusion, lifeguards are able to perform good Q-CPR on a still small IRB. Although the indication of immediate on-boat CPR remains to be elucidated, lifeguards should be aware of this fact and train CPR on-board.

Conflict of interest

The authors declare that they have no conflict of interest.

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