

Time delay and performance of CPR in surf lifeguards after simulated cardiac arrest due to drowning

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Background

In drowning cases ambulance response time is long, median 15 min (1), it is also known that submersion times longer than 9–16 minutes have poor outcome (2,3,4). CPR increases overall survival and decreases severe neurological damage if initiated early (5). ILS, states that a surf lifeguard should be able to perform a rescue of a conscious victim at 100m from shore (6). In-water ventilations can be given in the water and might double survival and improve neurological survival (2). Quality of CPR in healthcare personnel has been shown to be affected over 1–5 minutes (7).

Aim

To describe time-delay during surf rescue and compare quality of CPR before and after exertion in surf lifeguards.

Methods

A total of 40 surf lifeguards at Tylosand SLSC Sweden, 65% men, age 19–43 performed single rescue CPR for 10 minutes on a Laerdal Skillmeter Resusci Anne manikin. The test was repeated with an initial simulated surf rescue on an uncounscious 80kg victim 100m from shore. Time to victim, to first ventilation and to start of CPR was documented.

Results

Mean time in seconds to start of ventilations in the water was 155 ± 31 (mean+sd) and to start of CPR 258 ± 44 . Men were significantly faster during rescue (mean difference 43 seconds) than women, ($p=0.002$). Mean compression depth (mm) at rest decreased significantly from 0–2 minutes, ($42.6+7.8$) to 8–10 minutes ($40.8+9.3$; $p=0.02$). Mean compression depth after exertion decreased significantly ($44.2+8.7$ at 0–2 minutes to $41.5+9.1$ at 8–10 minutes ; $p=0.0008$). Compression rate/minute decreased after rescue from $117.2+14.3$ at 0–2 minutes to $114.1+16.1$ after 8–10 minutes ($p=0.002$). Proportion of correct compressions at 8–10 minutes was identical before and after rescue (62%).

Discussion

This study has described time delay during simulated surf-rescue at a set distance – 100m with just one lifeguard, These are 'worst-case-scenarios' and times presented can probably be improved. Present study confirms the assumption of Reilly that surf lifesavers possess the necessary fitness to perform CPR (8). In this study even after a water rescue. The impact of a real life drowning event on fatigue and compression depth remains to be evaluated.

Conclusion

In a simulated drowning at 100 m, it took twice the time bringing the patient as reaching him, men were significantly faster. Half the participants delivered continuous chest compressions > 38 mm during 10 minutes of single-rescuer CPR. Quality was identical before and after surf rescue.

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