



Bystander resuscitation of a near-drowning child in a rural south China township

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Abstract

We report resuscitation of a near-drowning child by a bystander in a rural south China township. Resuscitation was performed on a 6-year-old, otherwise healthy boy who was witnessed drowning in a river, with submersion for approximately 12 min. Following several resuscitation attempts, spontaneous breathing was established at the scene and the boy was transferred to a nearby hospital. He developed pneumonia but recovered completely on the ward and was discharged without any neurologic disabilities. This case shows that early bystander resuscitation is an important factor for survival after submersion. The search for an ideal approach to resuscitation must continue, and all members of society must work together towards this goal.

Keywords: Resuscitation, Drowning, Bystander cardiopulmonary resuscitation

Introduction

Drowning is the leading cause of accidental death in children <14 years of age in China, and accounts for 40% of all accidental deaths. Drowning occurs more often in rural areas than in cities [1]. Bystander rescue and resuscitation of drowning victims contributes to positive outcomes [2]. Some recent studies have concluded that drowning victims have a good chance of survival when bystander resuscitation is started before the arrival of the emergency medical services (EMS). Outcome is poor if rescue or resuscitation is delayed. The behavior of bystanders has been shown to be one of the most important factors influencing the survival of drowning victims [3–8]. Here, we report a case of bystander resuscitation of a near-drowning child in a rural south China township.

Case presentation

On the afternoon of Saturday, 17 December 2011, a healthy 6-year-old boy was witnessed drowning in a river in a rural south China township. When the boy dropped in the river, his friends called for help immediately. Fortunately, two fishermen working near the river heard their cries and pulled the boy out of the river. Some witnesses dialed 110 or 120 to call the police and EMS. The outside temperature was 17°C. We subsequently ascertained that the boy's submersion time was approximately 12 min. Despite bystander hands-only cardiopulmonary resuscitation (CPR) the boy was unconscious, not breathing, and pale when the police arrived. Because the EMS center was a long way from the scene, the health providers took a long time to arrive. A police officer put the boy on the ground in a supine

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position and performed abdominal thrusts at the scene, without guidance from a health care provider. The initial resuscitation efforts were ineffective and another resident suggested that the police officer perform a special resuscitation method. He asked the police officer to invert the boy's body and clear his airway of aspirated water, put the boy on his shoulder in prone position and jog. The police officer followed this suggestion immediately, resuscitative efforts continued and abdominal thrusts were performed. Finally, the boy began to gasp, they put him down and dressed him to keep him warm. However, the above resident suggested that the police officer repeat this special resuscitation method, including the abdominal thrusts. The police officer carried out this suggestion while another police officer called the EMS again and drove a police motorcycle to lead the ambulance to the scene. After 6 min, the boy began to breathe spontaneously and blinked his eyes. At this time, the ambulance arrived. The boy was transferred to a nearby hospital. He developed pneumonia but recovered completely on the ward and was discharged without any neurologic disabilities.

Conclusions

Recent epidemiologic data have shown that the burden of drowning is much greater than expected. Prevention and timely rescue are the most effective means of reducing the number of persons at risk. Early bystander CPR is the most important factor influencing survival after submersion [9]. Several studies have shown that the only victims who survived were those who were immediately resuscitated at the scene. Of the drowning victims who received bystander CPR, 50%–80% survived to hospital discharge [10–12]. Pepe et al. [11] and Goh and Low [13] found that none of the victims survived when resuscitation was delayed until the EMS arrived. One consistent conclusion drawn from these recent studies is that basic life support, and sometimes rescue breathing alone, performed by lay persons plays a key role in promoting survival. The case presented herein supports this opinion.

Most residents in rural China are farmers and have a relatively low level of education. Few residents have experience in rescuing drowning victims. In the current case, nobody, including the policemen, knew how to perform standard CPR. A lay bystander performed hands-only CPR on the boy, but he

did not perform compressions at an adequate rate and depth, and interrupted the chest compressions. According to the 2010 American Heart Association guidelines on drowning, the most important and detrimental consequence of submersion is hypoxia. Therefore, oxygenation, ventilation, and perfusion should be restored as rapidly as possible [14]. However, nobody provided cycles of compressions and ventilations in this case. The routine use of abdominal thrusts or the Heimlich maneuver for drowning victims is not recommended in the new guidelines [14].

In the current case, the boy began breathing spontaneously at the scene and recovered completely without any neurologic disabilities. Is bystander resuscitation using this special method useful? In our opinion, the drowning boy might have been at risk of near-cardiac arrest. This special resuscitation method is popular in south China and has saved some drowning victims. It is similar to the Inversion Method and the Trotting Horse Method. The Inversion Method was originally practiced in Egypt almost 3500 years ago and regained popularity in Europe. This method involves hanging the victim by his feet, with chest pressure to aid expiration and pressure release to aid inspiration. The Trotting Horse Method was developed in 1812. Lifeguards were provided with a horse, and when a victim was rescued from the water, the lifeguard would hoist the victim onto his horse and run the horse up and down the beach. This resulted in alternate compression and relaxation of the chest cavity as a result of the bouncing of the body on the horse [15]. Thus far, these two methods are not recommended in the new guidelines, drawn up according to evidence-based medicine. It is therefore necessary to teach the public how to perform high-quality CPR. It is estimated that >85% of drowning cases could be prevented by supervision, swimming instruction, technology, regulation, and public education [16].

When someone is in danger, doing something is better than doing nothing, and the dedication of the public to saving lives should be applauded. However, investigations into techniques of resuscitation must continue and all members of our society must work together to develop the ideal approach.

Conflict of interest

The authors declare no conflict of interest.



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