



Letter to the Editor

Over time, differences in survival and favorable neurologic outcomes between conventional and compression-only cardiopulmonary resuscitation have been gradually reduced in pediatric out-of-hospital cardiac arrest



Sir,

I read with interest the article by Goto et al. [1] assessing whether bystander compression-only cardiopulmonary resuscitation (CPR) is equivalent to conventional CPR in children with out-of-hospital cardiac arrest (OHCA). The study reports that conventional CPR was associated with improved outcomes compared to compression-only CPR in the majority of the subgroups following pediatric (1–17 years old) OHCA. However, I have some concerns about the conclusion of this article.

A previous observational study from Japan [2] including pediatric patients who had OHCA between 2005 and 2007 indicated that conventional CPR was associated with favorable neurological outcomes compared to compression-only CPR for pediatric (1–17 years old) OHCA of non-cardiac causes (adjusted odds ratio [OR] 5.54, 95% confidence interval [CI] 2.52–16.99), and either conventional or compression-only CPR was similarly effective in cases of cardiac causes (adjusted OR 1.20, 95%CI 0.55–2.66).

On the other hand, our recent study [3] including pediatric (1–17 years old) patients who experienced OHCA in Japan from 2011 to 2012 indicated that there was no difference in neurologically favorable survival between conventional and compression-only CPR after propensity score matching (18.0% vs 15.5%, $P=0.3698$; OR 1.20, 95% CI 0.81–1.77). A subgroup analysis showed that a similar association of the type of bystander CPR and neurological outcome was observed even in the non-cardiac etiology group (adjusted OR 1.25, 95% CI 0.62–2.46).

It was conceivable that one of the possible reasons for the different findings between the previous study [2] and our study [3] was a difference in the study period; there were some changes in resuscitation practices, including dissemination of compression-only CPR, dispatcher-assisted CPR, the sequence of CPR (from A-B-C to C-A-B), or post-resuscitation care (e.g., targeted temperature management) based on the 2010 international CPR guidelines update. Although rescue breathing may have had an important role in bystander CPR in the past, changing times may have reduced the relative importance of rescue breathing.

Fig. 2 -C in the article by Goto et al. [1] shows the fact that the neurologically favorable survival rate has increased over time in pediatric (1–17 years old) patients receiving compression-only CPR

(P for trend = 0.02), and the difference in the rate of favorable neurologic outcomes between conventional and compression-only CPR has been gradually reduced (in 2007–2008, 8.3% vs 4.4%, $P<0.001$; in 2009–2010, 9.0% vs 5.2%, $P=0.04$; in 2011–2012, 9.8% vs 6.5%, $P=0.15$; and in 2013–2014, 11.2% vs 8.8%, $P=0.38$).

Thus, I agree that, in the past, conventional bystander CPR (rescue breathing) had a great impact on neurological outcomes after pediatric (1–17 years old) OHCA, especially in cases of non-cardiac causes. However, the findings from Goto et al. [1] can be interpreted as that the difference between conventional and compression-only CPR is decreasing and that the effect of compression-only CPR has been equivalent to conventional CPR in recent years. To put the study findings to practical use, the settings or circumstances in which the study was conducted must be consistent with the current situation.

References

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Tatsuma Fukuda^{a,b,*}

^a Department of Emergency and Critical Care Medicine, Graduate School of Medicine, University of the Ryukyus, Okinawa, Japan

^b Center for Resuscitation Science, Department of Emergency Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA

* Corresponding author at: Department of Emergency and Critical Care Medicine, Graduate School of Medicine, University of the Ryukyus, 207 Uehara, Nishihara-cho, Okinawa, 903-0215, Japan.
E-mail address: tfukuda@hsph.harvard.edu

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