# Major differences between conventional and compression-only cardiopulmonary resuscitation

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Dear Editor,

I read the article by Skulec et al. "Rescuer fatigue does not correlate to energy expenditure during simulated basic life support," with great interest. (1) Although conventional cardiopulmonary resuscitation (CCPR) has been considered a standard CPR method since 1960, compression-only CPR (COCPR) has emerged as an alternative method to CCPR because of some evidence favoring COCPR. (2,3)

Therefore, numerous studies have attempted to determine whether COCPR could indeed improve the quality of CPR. A systematic review of these studies confirmed several obvious differences. (4)

First, CCPR may provide greater chest compression depth (CCD) and maintain adequate CCD for a longer period than COCPR. Second, COCPR may result in greater rescuer fatigue than CCPR. Third, COCPR may guarantee a higher number of total compressions and higher chest compression fraction (CCF).

The result presented by Skulec et al. is surprising because it is contrary to the current evidence. Is it true that the energy expenditure of CCPR is higher than that of COCPR? I partially agree with their conclusion. However, there are some important issues that need to be addressed to accurately interpret the study results.

The researchers limited the ventilation phase to 5 seconds. Recently, I conducted a similar study comparing CCPR and COCPR. In my experience, the average compression time per CPR cycle was 15.6 ± 1.8 s, and the average ventilation time per cycle was 9.4 ± 1.7 s during the 10-min-CCPR trials conducted by the CPR team member (medical doctor) of our hospital (n = 20, unpublished data). The CCF of the CCPR group was calculated as 63.7% and that of the COCPR group was 99.2%. Clinical data also showed that the median interruption time for 2 ventilations was 7 seconds and longer pauses for ventilations were not associated with a worse outcome. (5) Limiting the ventilation phase to 5 seconds could theoretically increase the CCF over 75%. Considering that even highly experienced rescuers could maintain a CCF as high as 63.7%, limiting the ventilation phase to 5 seconds might stress the novice rescuers (medical students), which may affect the energy expenditure of the CCPR group.

As expected, the ventilation phase can serve as a resting period during CCPR. In my experience, the rescuer's heart rate decreases rapidly after the chest compression phase and reaches the baseline level after the ventilation phase. The CCPR group's heart rates exhibited a sine wave pattern. This finding indicates how the ventilation phase plays a role during CCPR. Limiting the ventilation phase to 5 seconds might result in an incomplete alleviation of the rescuer's workload. In addition, the researchers provided continuous feedback to the study participants throughout the experiments. Although this feedback might be reproduced by dispatcher-assisted CPR as indicated by the authors, it was unrealistic considering the varied environment of out-of-hospital cardiac arrests. If the researcher wanted to compare the energy expenditure between CCPR and COCPR, other interventions, which could affect the CPR quality or energy expenditure, should not be used.

Although there were some concerns, this study could shed new light on comparing CCPR and COCPR. Further study should be warranted to confirm whether the energy expenditure of CCPR is indeed higher.

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