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*Togay Evrin¹, Karol Bielski², Kacper Kranc², Dominika Dunder², Marek Dabrowski³, Marcin Madziala²

Should we look for new methods of chest compressions in newborns and infants?

Czy powinniśmy poszukiwać nowych metod kompresji klatki piersiowej u niemowląt i noworodków?

¹Department of Emergency Medicine, UFuK University Medical Faculty, Dr Ridvan Ege Education and Research Hospital, Ankara, Turkey

²Lazarski University, Warsaw, Poland

³Chair and Department of Medical Education, Poznan University of Medical Sciences, Poland

SIR,

We have read with great attention the article by Smereka et al. published in "Progress in Medicine Journal", which raises the issue of the quality of cardiopulmonary resuscitation in infants (1). The paper refers to Smereka et al. novel newborn chest compression method using two thumbs directed at the angle of 90° to the infant's chest while closing the fingers of both hands (2-4). The published study seemed very interesting and therefore we decided to verify the effectiveness of three methods of chest compressions in infants. We performed a cross-over randomized manikin study in a group of 52 nurses. During the study, we used two methods recommended by both the European Resuscitation Council and the American Heart Association: the two-finger technique and the standard two-thumb technique. Additionally, a novel two-thumb chest compression technique described by Smereka et al. was applied for evaluation (4).

The study involved 52 nurses whose average age was 34.5 ± 6.5 years and mean work experience equaled 8.5 ± 4.8 years. The participants were instructed in all three chest compression methods applied in a standard infant manikin, ALS Baby trainer (Laerdal,

Stavanger, Norway). Then, after a week from the training, a targeted study was conducted in which the nurses were asked to perform continuous chest compressions for 2 minutes. Only chest compression parameters were analyzed. The involved manikin represented an infant and allowed to record the parameters of frequency and depth of compressions, the degree of chest relaxation, as well as the correctness of hand position on the chest during the compressions (5-8). The order of both compression techniques and the participants was random; for this purpose, Random Allocation Software version 1.0 was used.

Table 1 presents the results of our study. The two-finger technique turned out inadequate in terms of chest compression depth and rate, but revealed good quality in hand position and full chest release. Both two-thumb techniques allowed to achieve adequate chest compression rate and depth, but the novel chest compression technique described by Smereka et al. was bound with a significantly better chest compression full release (92 vs 51%) as compared with the standard two-thumb technique. Our results suggest that the novel chest compression technique offers several advantages and further animal studies should be performed.

Tab. 1. Infant chest compression quality parameters in the three examined methods

Parameter	Two-finger technique	Standard two-thumb technique	New two-thumb technique	p-value
Chest compression depth [mm]	33 (IQR: 31-36)	41 (IQR: 36-42)	40 (IQR: 38-41)	0.013
Chest compression rate [/min]	130 (IQR: 127-135)	116 (IQR: 110-124)	118 (IQR: 114-122)	0.045
Full chest release [%]	87 (IQR: 82-95)	51 (IQR: 36-59)	92 (IQR: 87-100)	0.003
Correct hand position [%]	100 (IQR: 95-100)	97 (IQR: 91-99)	100 (IQR: 94-100)	0.712

BIBLIOGRAPHY

1. Smereka J, Szarpak L, Makomaska-Szaroszyk E et al.: Comparison of two chest compression techniques during infant resuscitation. A randomized, cross-over study. *Postępy Nauk Medycznych* 2018; XXXI(4): 209-214.
2. Smereka J, Szarpak L, Smereka A et al.: Evaluation of new two-thumb chest compression technique for infant CPR performed by novice physicians. A randomized, crossover, manikin trial. *Am J Emerg Med* 2017; 35(4): 604-609.
3. Smereka J, Kasinski M, Smereka A et al.: The quality of a newly developed infant chest compression method applied by paramedics: a randomized crossover manikin trial. *Kardiologia Polska* 2017; 75(6): 589-595.
4. Smereka J, Iskrzycki L, Makomaska-Szaroszyk E et al.: The effect of chest compression frequency on the quality of resuscitation by lifeguards. A prospective randomized crossover multicenter simulation trial. *Cardiol J* 2018 Oct 19. doi: 10.5603/CJ.a2018.0121 [Epub ahead of print].
5. Szarpak L, Truszczyński Z, Smereka J et al.: Does the use of a chest compression system in children improve the effectiveness of chest compressions? A randomised crossover simulation pilot study. *Kardiologia Polska* 2016; 74(12): 1499-1504.
6. Wiecek W, Kamińska H: Impact of a corpuls CPR Mechanical Chest Compression Device on chest compression quality during extended pediatric manikin resuscitation: a randomized crossover pilot study. *Disaster Emerg Med J* 2017; 2(2): 58-63.
7. Abelairas-Gómez C, Barcala-Furelos R, Szarpak L et al.: The effect of strength training on quality of prolonged basic cardiopulmonary resuscitation. *Kardiologia Polska* 2017; 75(1): 21-27.
8. Czekajło M, Dąbrowska A: *In situ* simulation of cardiac arrest. *Disaster Emerg Med J* 2017; 2(3): 116-119.

Address/adres:

*Togay Evrin
Department of Emergency Medicine
UFuK University Medical Faculty
Dr Ridvan Ege Education
and Research Hospital
Konya Bulvarı No. 86-88, Balgat, Çankaya,
06520 Ankara, Turkey
E-mail: togayevrin71@gmail.com

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