

CPREzy™: A new adjunct to improve quality of chest compressions



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Background. . .

- external chest compressions essential for resuscitation
- no device implemented as standard

Fig. 1: CPREzy™



The rhythmic compression of the heart is an essentially necessary measure in the context of Cardiopulmonary Resuscitation (CPR). Hereby a downward pressure is achieved which leads to a circulation with sufficient perfusion of the vital organs – in particular the brain – even though the heart has stopped beating. The manual compression of the thorax (External Chest Compressions - ECC) is normally executed without any aids at all both by trained laypersons and by healthcare professionals in emergency medicine or hospitals. Despite the development of different aids to ECC in the past years, none of these devices have become established in daily practice.

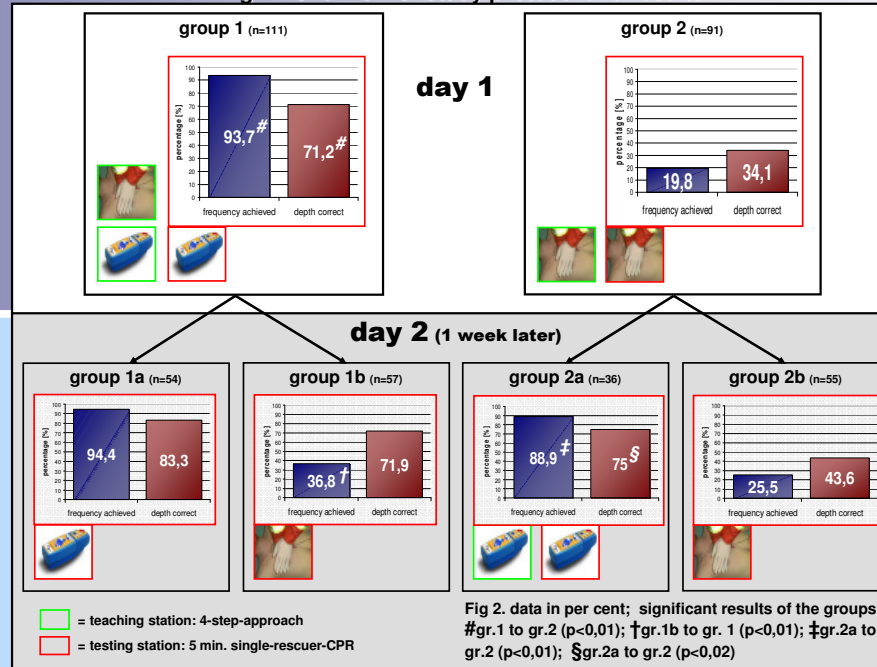
With the "CPREzy™" (Health Affairs, UK), comparatively simple equipment was tested, which is designed to support the user in performing ECC. Having applied it to the lower end of the sternum, compressions are executed by the user on the top of the CPREzy-pad. The depth is indicated during the compression by a row of LEDs which light up and are marked for children, small, normal, large and very large adults (fig. 1). When the pressure is released correctly these LEDs expire after each compression. A clearly audible beep at the rate of 100/min. indicates the necessary speed of the ECC.

Methods. . .

- 202 subjects in cardiac arrest scenario
- primary endpoints for compressions
 - frequency 90 - 110/min.
 - depth 40 - 50 mm

In a prospective randomized study, 202 first-year medical students were asked to carry out 5 min. of single-rescuer-CPR on a manikin (Laerdal Resusci Anne Skillreporter). Subjects with previous training in emergency medicine (e.g. paramedics and nursing staff) were excluded. For allocation of the groups see fig. 2.

Fig. 2: Overview of study protocol and results



Group 1 was taught classic CPR first followed by CPR with CPREzy and was then tested in CPR with CPREzy. For the learning process the standardised so-called 4-step-approach of the European Resuscitation Council was used. In group 2 only classic CPR was taught and examined. On the second test day the following sub-groups were formed within the groups: 1a was examined again in CPR with CPREzy, 1b only in classic CPR, 2a was instructed in CPR with CPREzy and then examined, 2b was again tested in classic CPR. The primary observed end points were aligned to the current Guidelines [1]: Reach a compression rate of 90 - 110/min., as well as a compression depth from 40 to 50 mm. Further the frequency of incomplete decompression and wrong hand positioning were observed.

Results. . .

- frequency and depth of compressions significantly improved with CPREzy
- lasting effect for compression depth after training with CPREzy
- control group performs continuously bad

Group 1 showed significantly better results than group 2 for the correct rate and the correct depth of compression. There were no significant differences in the number of incomplete decompressions and incorrect hand positioning detected among the groups. The subjects tested on the first evaluation with CPREzy and on the second evaluation without the device (group 1b) performed significantly worse regarding the rate of compressions, whereas compression depth, decompression and hand positioning remained unchanged. The group 2a - tested with CPREzy initially on the second evaluation - presented a significant improvement for the correct rate and depth, without influence on decompression and hand positioning. In group 2b a consistently poor performance during both evaluations appeared. The subjects accomplishing ECC with CPREzy (groups 1a and 2a) demonstrated similar results without

any significant difference concerning all observed endpoints. Comparing the subjects carrying out classic ECC, group 1b performed significantly better than group 2b in respect of the correct depth of compression, whereas the rest of the observed parameters showed just marginal differences without any significance.

Conclusion. . .

- CPREzy improves external chest compressions after short training

The use of the simple, portable and re-usable device CPREzy by previously untrained people leads to a significant improvement in a cardiac arrest scenario compared to standard training regarding rate and depth of the External Chest Compressions.

CPREzy is able to achieve an enduring effect for the compression depth after it has been used for resuscitation training.

Further studies with real patients and compressions performed by healthcare professionals must confirm these data in the future.

Further information. . .

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Literature . . .

[1] The American Heart Association in collaboration with the International Liaison Committee on Resuscitation. Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. An international consensus on science. Circulation. 2000;102:1-384.

Thanks to . . .

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