Effect of Using an Audiovisual CPR Feedback Device on Chest Compression Rate and Depth

Jeremy CP Wee, 1MBBS (S’pore), MRCS (A&E) (Ed), Mooppil Nandakumar, 2MBBS, MRCP(UK), FAMS (Renal Medicine), Yiong Huak Chan, 3PhD, Rowena SL Yeo, 4BN, Adv. Dip in Nursing (Emergency), Kaldip Kaur, 4BN, Post-Basic (Renal), V Anantharaman, 1MBBS, FRCP (Edin), FRCS Ed (A&E), Susan Yap, 4RN, Marcus EH Ong, 1,5MBBS (S’pore), FRCS Ed (A&E), MPH

Abstract

Introduction: The aim of the study is to investigate the effect of using Automated External Defibrillator (AED) audiovisual feedback on the quality of cardiopulmonary resuscitation (CPR) in a manikin training setting. Materials and Methods: Five cycles of 30 chest compressions were performed on a manikin without CPR prompts. After an interval of at least 5 minutes, the participants performed another 5 cycles with the use of real time audiovisual feedback via the ZOLL E-Series defibrillator. Performance data were obtained and analysed. Results: A total of 209 dialysis centre staff participated in the study. Using a feedback system resulted in a statistically significant improvement from 39.57% to 46.94% (P = 0.009) of the participants being within the target compression depth of 4 cm to 5 cm and a reduction in those below target from 16.45% to 11.05% (P = 0.004). The use of feedback also produced a significant improvement in achieving the target for rate of chest compression (90 to 110 compressions per minute) from 41.27% to 53.49%; (P < 0.001). The mean depth of chest compressions was 4.85 cm (SD = 0.79) without audiovisual feedback and 4.91 (SD = 0.69) with feedback. For rate of chest compressions, it was 104.89 (SD = 13.74) vs 101.65 (SD = 10.21) respectively. The mean depth of chest compression was less in males than in females (4.61 cm vs 4.93 cm, P = 0.011), and this trend was reversed with the use of feedback. Conclusion: In conclusion, the use of feedback devices helps to improve the quality of CPR during training. However more studies involving cardiac arrest patients requiring CPR need to be done to determine if these devices improve survival.

Ann Acad Med Singapore 2014;43:33-8

Key words: Cardiopulmonary resuscitation, Chest compression, Quality

1Department of Emergency Medicine, Singapore General Hospital, Singapore
2Medical Services, The New National Kidney Foundation Singapore, Singapore
3Biostatistics Unit, Yong Loo Lin School of Medicine, National University of Singapore, Singapore
4Nursing Services, The New National Kidney Foundation Singapore, Singapore
5Office of Clinical Sciences, Duke-NUS Graduate Medical School, Singapore
Address for Correspondence: Dr Wee Choon Peng Jeremy, Department of Emergency Medicine, Singapore General Hospital, Outram Road, Singapore 169608. Email: jeremywee77@yahoo.com.sg