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Cardiopulmonary Resuscitation Performance Efficacy While Wearing a Powered Air-Purifying Respirator

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Abstract : Introduction: The use of personal protective equipment for respiratory infection control in cardiopulmonary resuscitation (CPR) is a physical burden to healthcare providers. It matters how long CPR quality according to recommended guidelines can be maintained under these circumstances. It was investigated whether chest compression time was appropriate for a 2-minute shift and how long it was maintained in accordance with the guidelines under such conditions. Methods: This prospective crossover simulation study was performed at a single center from September 2020 to October 2020. Five indicators of CPR quality were measured during the first and second sessions of the study period. All participants wore a Level D powered air-purifying respirator (PAPR), and the experiment was conducted using a Resusci Anne manikin, which can measure the quality of chest compressions. Each participant conducted two sessions. In session one, 2-minutes of chest compressions followed by a 2-minute rest was repeated twice; in session two, 1-minute of chest compressions followed by a 1-minute rest was repeated four times. Results: All 34 participants completed the study. The deep and sufficient compression rate was 65.9 ± 13.1 mm in the 1-minute shift group and 61.5 ± 30.5 mm in the 2-minute shift group. The mean depth was 52.8 ±4.3 mm in the 1-minute shift group and 51.0 ± 6.1 mm in the 2-minute shift group. In these two values, there was a statistically significant difference between the two sessions. There was no statistically significant difference in the other CPR quality values. Conclusions: It was suggested that the different standard of current 2-minute to 1-minute cycles due to a significant reduction in the quality of chest compression in cases of CPR with PAPR.

Keywords : cardiopulmonary resuscitation, chest compression, personal protective equipment, powered air-purifying respirator
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