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A prospective study assessing the quality of chest compressions delivered by anaesthetists during Cardiopulmonary Resuscitation

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Abstract

Background

Cardiopulmonary resuscitation (CPR) is an important skill taught to laypeople and medical professionals alike. As peri-operative care physicians, anaesthetists are required to be proficient in CPR and the skills thereof. The success of CPR delivered to patients in cardiac arrest is dependent on the provision of high-quality chest compressions including adequate depth and rate. We aimed to measure the quality of chest compressions delivered by anaesthetists working in an academic department.

Methods

This was a prospective, descriptive, manikin-based study which utilised a CPR manikin fitted with a chest compression feedback device to record CPR quality. Each participant was asked to perform uninterrupted chest compressions for 3 minutes. The data was then captured and processed using regression modelling to assess the rate, depth, and decay of compressions over time. The impact of age, sex, training level, and previous attendance at formal CPR training courses on chest compression quality was also assessed.

Results

One hundred and forty-two participants performed 49348 chest compressions over the period of 407 minutes. The overall quality of compressions was found to be very poor with only 1% (IQR: 0 to 14%) delivered adequately. The median rate of compressions was 123 compressions per minute (cpm) [IQR:122 to 123cpm], with only 19% (IQR: 1 to 68%) of compressions being within the optimal range. The median depth of compression was 4.9cm [IQR:4.7 to 5.3cm], with the median depth slipping below the 5cm lower bound after 75 seconds of compressions. The demographic variables of male sex and body mass index (BMI) were found to be weakly significant in improving the quality of compressions delivered over time.

Conclusion

This study's findings suggest that the chest compression quality delivered by anaesthetists, as per ILCOR guidelines, is generally poor. The real-life consequences of this are a reduced rate of CPR success and return of spontaneous circulation (ROSC). Based on our findings, which are in line with similar research, it may be prudent to consider the use of individuals with increased muscle mass, normal to raised BMI, and/or of male sex to perform compressions where possible. In addition, feedback devices could assist in improving chest compression quality and overall CPR.