BACKGROUND

High quality chest compressions are associated with improved outcomes after cardiac arrest. Defibrillators record important information about the quality of chest compressions during CPR and can be used in quality-improvement programs. Software made for reviewing defibrillator files can automatically annotate and measure chest compression metrics. However, evidence is limited regarding the accuracy of such measurements.

OBJECTIVE

To compare chest compression fraction (CCF) and rate measurements made with software annotation vs. manual annotation vs. limited annotation of defibrillator files recorded during Out-of-Hospital Cardiac Arrest (OHCA) CPR.

METHODS

This is a retrospective, observational study from the Dallas-Fort Worth site of the Resuscitation Outcomes Consortium. We reviewed chest compression waveforms from the bioimpedance channel of defibrillator recordings (Physio-Control Lifepak 12 and 15, Redmond, WA) of 100 OHCA patients from 9/8/2018 to 3/9/2019. Included cases were ≥18 years, had presumed cardiac cause of arrest, and were expected to have continuous chest compressions.

RESULTS

• Mean patient age: 63 years with 59% male
• Mean (±SD) duration of CPR: 30.4 ± 10.6 min
• Case mean CCF for software, manual, and limited annotation: 0.64 ± 0.19, 0.86 ± 0.07, and 0.81 ± 0.10, respectively.
• ICC for manual vs. limited annotation was good to excellent.

The software misidentified epochs before the start of chest compressions, failed to capture epochs after resuscitation ended, and after return of spontaneous circulation, resulting in low ICC for CCF when compared with manual and limited annotation. The ICC was excellent for compression rate because the software only counted epochs where chest compressions were actually given.

CONCLUSIONS

Software annotation performed very well for chest compression rate. With respect to CCF, the difference between manual and software annotation measurements was clinically important, while manual vs. limited annotation compared favorably.

LIMITATIONS

• This study used data from one ROC site.
• This study analyzed annotations using PhysioControl software. Software from other companies may provide different results.

REFERENCES

Yannopoulos D, et al. Resuscitation. 2015;94:105-113,