Submission Title:

Direct vs Video Laryngoscopy During Simulated Mechanical Chest Compressions: A Randomized Crossover Trial

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Abstract

Introduction and purpose

Mechanical compression devices are often utilized for CPR (mCPR). We sought to evaluate the time to intubation, operator confidence and success rates of endotracheal intubation with video laryngoscopy (VL) vs. direct laryngoscopy (DL) during simulated mCPR.

Methods

This study was a prospective, randomized crossover trial at a simulation center. 30 consenting emergency physicians were surveyed about experience and technique preferences, then performed intubations on an adult manikin with a moderately difficult airway while undergoing simulated mCPR (LUCAS 3.0, Stryker Corp.) at 100 compressions/min. Technique order was randomized. Intubation time defined as blade pick up until the tube cuff inflated. Subjects were asked to rate success confidence on a 5-point scale (high= 5) and to provide the Cormack/Lehane grade (difficult = 3 or 4). They repeated the scenario with the alternate technique. Categorical variables were analyzed by chi-square; continuous variables by t-tests. Multivariate logistic regression was performed to control for confounding

Results

There were 30 subjects; 73% with 1-5 years of experience, 40% with >100 prior intubations, 73% utilized mac 4 direct blade, and 60% prefer VL during CPR. Subjects had first pass intubation success for all but one of the attempts with both modalities (NS). Subjects more often expressed "high confidence" that intubation was successful for direct 60% vs. video 77% (p=0.2) but they more often rated the airway "difficult" for

direct (40% vs. 10%; p=0.01). Within bivariate analysis, mean time difference to intubate was less for DL vs. VL (-6.8 seconds; p=0.02). There were no significant associations between time differences to intubate for the following variables: experience (p=0.6), > 100 prior intubations (p=0.8), blade size used (p=0.3), preferred technique (p=0.8) high confidence successful DL (p=0.5), high confidence successful VL (p=0.7), rating of difficult view DL (p=0.8) and rating of difficult view VL (p=0.9). In the multivariate logistic regression with time difference as the dependent variable, there were no statistically significant independent variables.

Conclusion

We found a lower mean time difference to intubation for DL vs. VL during simulated mCPR, though such differences are unlikely clinically meaningful. Subjects were more confident that intubation was successful using VL.