

Potential Role of the Vocal Chords During Cardiopulmonary Resuscitation

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Introduction: The purpose of this investigation was to determine whether passive movement of the vocal cords during cardiopulmonary resuscitation (CPR) affects changes in intrathoracic pressure. Recent studies demonstrate that lowering intrathoracic pressure (ITP) during the decompression phase of CPR enhances venous return.

Methods: Standard (S) and active compression-decompression (ACD) CPR were studied in a porcine model. After 4 min. of ventricular fibrillation, CPR was started. Pigs (n = 5) were ventilated with a laryngeal mask airway (LMA), and infra- and supra-vocal chord pressures were measured electronically. CPR was performed with an automated device \pm an inspiratory impedance threshold valve (valve). The valve permits resistance-free expiration but prevents inspiration except when active ventilation is performed. S- and ACD CPR were each performed \pm the valve in the same pig in a randomized order for 2 min.

Results: A significant transvocal chord pressure was observed during the decompression phase with both S-CPR and ACD CPR (see table). In addition, in 3/5 animals a compression phase transvocal chord gradient was observed. Use of the valve further decreased negative ITP during chest wall decompression but did not alter ITP during compression.

	Above Chords	Below Chords
STD	-0.7 \pm 0.4	-3.0 \pm 0.7*
STD + valve	-5.0 \pm 0.7	-6 \pm 1.1*
ACD	-1.6 \pm 0.4	-3.7 \pm 0.7*
ACD + valve	-5.8 \pm 1.3	-6.8 \pm 0.7*

*p<0.05

Conclusion: These data demonstrate that the vocal chords may play a previously unrecognized role in enhancing both negative intrathoracic pressure during the decompression phase of S-CPR and ACD CPR, as well as positive intrathoracic pressure during the compression phase. The results support a potentially unrecognized role for the vocal chords in CPR efficacy.