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Capnography in Hypoxic Pseudo-Pea May Correlate to the Amount of Required Intervention for Resuscitation

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Abstract : Introduction: Pseudo-Pulseless Electrical Activity (p-PEA) is a lifeless form of profound cardiac shock characterized by measurable cardiac mechanical activity without clinically detectable pulses. Patients in pseudo-PEA carry different prognoses than those in true PEA and may require different therapies. End-tidal carbon dioxide (ET-CO2) has been studied in ventricular fibrillation and true PEA but in p-PEA. We utilized an hypoxic porcine model to characterize the performance of ET-CO2 in resuscitation from p-PEA. Hypothesis: Capnography correlates to the number of required interventions for resuscitation from p-PEA. Methods: Female swine (N = 14) under intravenous anesthesia were instrumented with aortic and right atrial micromanometer pressure. ECG and ET-CO2 were measured continuously. p-PEA was induced by ventilation with 6% oxygen in 94% nitrogen and was defined as a systolic aortic (Ao) pressure less than 40 mmHg. Pigs were grouped based on the interventions required to achieve ROSC: 100%O2, 100%O2 + CPR, 100%O2 + CPR + epinephrine. Results: End tidal CO2 reliably predicted O2 therapy vs CPR-based interventions needed for resuscitation (Figure 1). Pigs who would recover with 100%O2 only had a mean ET-CO2 slope of 0.039 ± 0.013 [R2 = 0.68], those requiring oxygen + CPR had a slope of -0.15 ± 0.016 [R2 = 0.95], and those requiring oxygen + CPR + epinephrine had a slope of -0.12 ± 0.031 [R2 = 0.79]. Conclusions: In a porcine model of hypoxic p-PEA, measured ET-CO2 appears to be strongly correlated with the required interventions needed for ROSC. If confirmed clinically, these results indicate that ET-CO2 may be useful in guiding therapy in patients suffering p-PEA cardiac arrest.

Keywords : pseudo-PEA, resuscitation, capnography, hypoxic pseudo-PEA
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