POSTER 23-68

Spontaneous Agonal Respiration in a Swine Model of Out-of-Hospital Cardiac Arrest

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Background: Agonal respiratory efforts frequency are observed in out-of-hospital cardiac-arrest victims, yet this phenomenon has not been studied. American Heart Association curricula contain no mention of this activity.
Purpose: To describe ventilatory dynamics following the onset of ventricular fibrillation (VF) in an experimental swine model.
Methods: Twelve female, mixed-breed, domestic swine (mean mass = 21.3 ±1.7 kg) were sedated with IM ketamine (10 mg/kg) and xylazine (1 mg/kg), anesthetized with alpha-chloralose (40 mg/kg loading dose, 10 mg/kg/hr maintenance infusion), instrumented, intubated, and mechanically ventilated with room air. VF was induced with a 3s, 60 Hz, 100 mA transthoracic shock, and untreated respiratory rate. Tidal volume and minute ventilation were recorded using a Bourns Ventilation Monitor (Model LS75, Life Systems, Riverside, Calif.). Observations were made until respiratory activity ceased. Normal values: rate = 12–14 cycles/min; tidal volume = 400 ml, minute ventilation = 4.8–5.6 L.
Results: Values in table below are mean ±sd. (See table below.)
Conclusion: In this swine model, 11/12(92%) continued to have spontaneous agonal respirations for the first three minutes of cardiac arrest. Many animals had supranormal tidal volumes and near-normal levels of minute ventilation. Since observation of this common phenomenon by lay rescuers could result in delayed contact with EMS (and thereby delay to first countershock), some mention of it should be made in basic CPR curricula.

Minute	1	2	3	4	5	6	7
n breathing	12	12	11	5	3	2	2
Respiratory Rate (breaths/min)	6 ±2	8 ±2	6 ±2	5 ±2	7 ±2	8 ±2	11 ±2
Tidal Volume (ml)	611 ±400	502 ±286	584 ±425	852 ±140	641 ±261	670 ±99	656 ±33
Minute Ventilation (L/min)	3.6 ±2.3	3.3 ±1.6	3.5 ±3.0	4.6 ±2.2	4.8 ±3.0	5.8 ±2.2	4.4 ±3.4

24-79 POSTER

Heat Exposures of Prehospital Medications: Temperature Variations Within an ALS-Ambulance Drug Box

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Objectives: The majority of drugs typically carried on ALS ambulances are recommended to be stored at temperatures between 59 and 86 degrees Fahrenheit. These recommendations do not take into account the extreme temperature variations experienced in the prehospital environment. Data documenting the temperatures to which drugs are exposed in the field are sparse. The purpose of this study was to document the temperatures to which prehospital medications were exposed.
Methods: This was a prospective, convenience sample study, in an urban all-ALS EMS system with an annual call volume of 60,000. A continuous recording thermometer was placed in the drug box of an air-conditioned, type-I ambulance, and stored in its normal location. Continuous measurements were obtained over one month (July 1993) with daily calibrations to ensure accuracy. Hourly temperature data from the recording device were compared to National Weather Service data for ambient air. Data were analyzed with RMANOVA and Scheffe multiple comparisons (alpha = 0.05)
Results: Mean temperatures for 24 days are tabulated below. RMANOVA was significant (p <0.001), and all pairwise hourly comparisons also were significantly different (p <0.05). (See table below.)
Conclusions: Temperatures within the drug box were significantly higher than ambient air, and consistently were higher than the recommended storage temperatures. Although most prehospital drugs are stable within certain limits beyond published recommendations, questions remain concerning the effects of these temperatures on potency, shelf life, and bio-availabitity.

Time	1200	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200
Air	71	69	67	67	70	76	80	84	84	84	79	75
Box	89	89	87	87	85	85	88	90	92	92	93	93

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