1003-32 Superior Outcome With Immediate Manual Defibrillation Versus Automated External Defibrillation in a Swine Model of Prehospital Ventricular Fibrillation Cardiac Arrest

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Background: Automated External Defibrillators (AED) are increasingly used by prehospital personnel to diagnose and treat ventricular fibrillation (VF) because of lower cost and simple instructions. The AED diagnostic algorithm process prolongs the time interval of untreated VF. We proposed that after prolonged VF (typical of prehospital VF), defibrillation with an AED using manufacture recommendations would result in worse outcome than immediate manual defibrillation. Methods: After 8 minutes of untreated VF, 23 swine received either AED diagnosis and defibrillation (AED) with biphasic truncated exponential waveform 150J shock or immediate manual defibrillation (IMMED) using paddles with monophasic waveform (4J/kg) after clinical diagnosis of VF. Standard ACLS was then provided. Successfully resuscitated animals received one hour of intensive care support and were evaluated for 24-hour survival and neurological outcome. Results: The AED resulted in a 60 second delay in defibrillation. 1-hour survival (SURV-1), 24-hour survival (SURV-24) and good neurologic outcomes (Neuro-good) are presented in Table (* p<0.05, **p<0.01). In the immediate defibrillation group 9 of 15 survivors at 24-hour had good neurological outcome vs none in the AED group. Conclusion: In this swine model of prehospital VF, AED diagnosis which had a net 60 second delay in defibrillation resulted in worse neurologic and 24-hour survival outcome than immediate manual defibrillation.

Table: AED vs. Immediate Manual Defibrillation

	SURV-1	SURV-24	NEURO-GOOD
AED	3/8	0/8*	0/8**
IMMED	13/15	13/15*	9/15**

1003-33 Flight Attendant Response to AED Instruction: Results of a Survey and Implications for Training Public Access Defibrillation

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Background: The program at American Airlines represents the largest automated external defibrillator (AED) training effort ever undertaken, and as such may provide insights for the development of public access defibrillation.
Methods: A questionnaire was developed to evaluate flight attendant (FA) training, program implementation, and response to AED use. This was provided to consecutive FA from 1/00 to 6/00 at the time of annual AED retraining.
Results: A total of 4,455 surveys were completed. The average FA age was 41 years and 84% were women. 50% had previously been on duty at a medical emergency and 6% had witnessed death as the outcome of an emergency. The AED class duration (4.5 hours initially and 90 minute annual update) was considered "just right" by 94%, while 3.6% and 2.3% said it was too short and too long, respectively. The training was considered "adequate" or "very adequate" in 98%. The degree of "comfort in handling in-flight emergencies" was assessed on a scale to 1 (very) to 5 (not); this index improved from 2.8 before training to 1.4 after AED training (p<0.01). While 50% of surveyed FA reported previous involvement in a medical emergency, only 7.3% had been present during the use of an AED. Among this cohort with AED clinical experience, comfort in handling in-flight emergencies remained high (comfort index=1.3). The AED protocol called for use of the device with the patient supine, and as such it was used in the aisle, bulkhead or galley in 63% of aircraft uses; however, in 37% the AED was used in the passenger seat. Passengers often assisted during AED use, and were considered to be helpful or very helpful by 59% of FA. Although volunteer physicians (when present) were considered helpful or very helpful by 92% of the FA, 16% of FA reported that they "impeded" use of the AED itself.
Conclusions: 1) The FA training program is seen as adequate and of the correct length; 2) Comfort with medical emergencies rises dramatically after AED training, and remains high after actual use of the AED; 3) Generally, bystanders and volunteer physicians are deemed helpful, although a significant proportion of FA reported that physicians impeded AED use; 4) These data have important implications for training in the use of the AED.

1003-34 Cardiac Troponin I Predicts Mortality Pediatric Out-of-Hospital Cardiopulmonary Arrest

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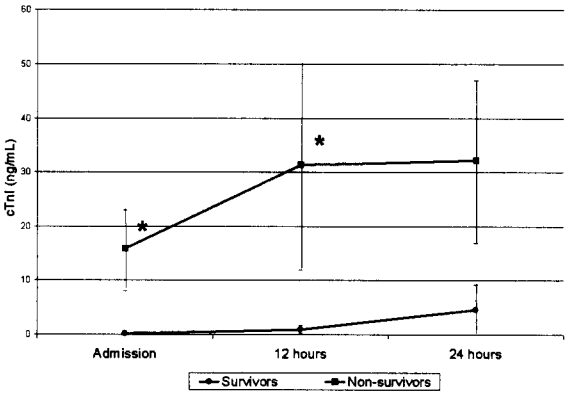
Background: Elevations of serum levels of cardiac Troponin I (cTn) are correlated to an increased risk of death following myocardial infarction, sepsis, and cardiac surgery involving cardiopulmonary bypass. The purpose of this study was to determine whether cTnI elevation correlates with mortality in children who have suffered an out-of-hospital cardiopulmonary arrest. Materials and Methods: We prospectively examined all children admitted to the Pediatric Intensive Care Unit (PICU) who required cardiopulmonary resuscitation (CPR) prior to arrival to the Emergency Department (ED). CTnI measurements were obtained on admission to the PICU, 12, and 24 hours following admission. CTnI measurements were performed on the Abbott Axsym System. The positive cutoff suggestive of myocardial injury is 2.0 ng/ml. Results: Seventeen children were enrolled in a 10-month period. Cause of the arrests included drowning/near drowning in 12 cases, one accidental hanging, one smoke inhalation, one non-accidental trauma, and 2 with an unknown cause. Overall survival to discharge was 29% (5/17). Non-survivors had a significantly higher cTnI at admission and 12 hours. (Figure, *p<0.05) Additionally, cTnI was below the positive cutoff suggestive of myocardial injury in all survivors.
Conclusion: Cardiac Troponin I elevation predicts mortality in children who have suffered an out-of-hospital cardiac arrest. Exact levels of elevation that correlate to mortality need to be further elucidated.



1003-35 Defibrillation Threshold and Cardiac Function Using an External Biphasic Defibrillator in Pediatric-Sized Pigs

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Background: Before pediatric recommendations for using a biphasic automatic external defibrillator (AED) can be made, a dosing strategy needs to be determined to allow ventricular defibrillation of 8 year olds while causing a minimal amount of cardiac damage to infants. Methods: Either pediatric or adult self-adhesive electrode patches were applied in a standard anterior-lateral position to 10 isoflurane-anesthetized mixed breed pigs (3.8 to 20.1 kg). The defibrillation threshold (DFT) was determined for biphasic truncated exponential waveform shocks delivered using an external defibrillator (Lifepak 12; Medtronic Physio-Control) following 30 seconds of 60-Hz induced ventricular fibrillation (VF). Additional shocks, varying from the DFT to 360 joules in 25-50 joule steps, were delivered either during sinus rhythm or following 30 seconds of VF. The initial use of adult or pediatric patches was alternated between pigs. Five minutes elapsed between test episodes. The time to return of normal sinus rhythm was measured following defibrillation. Cardiac output was measured at baseline and 1 min after each shock using the thermodilution method. Left ventricular dP/dt was calculated at 1, 10, 20, 30, and 60 seconds after the shock. Results: The DFT for pediatric and adult patches was 2.4 +/- 0.81 and 2.1 +/- 0.65 joules/kg, respectively (P=NS). The time to return of normal sinus rhythm increased significantly with increasing shock energy using both the pediatric and adult patches (regression line slope = 0.44 and 0.39 seconds/joule/kg, respectively). Cardiac output was not significantly different from baseline at 1 minute following shocks of up to 360 joules. dP/dt was significantly different from baseline at 1 and 10 seconds after the shock but was not different at 20, 30, or 60 seconds with shocks up to 360 joules with either patch size. Conclusions: The same amount of energy delivered with a biphasic AED successfully defibrillated 60-Hz VF whether adult or pediatric patches were used. Cardiac function, as measured by cardiac output and dP/dt, was unaltered at 1 minute after the shock with delivered energy of up to 360 joules.

1003-36 Survival of Myocardial Infarction Patients Treated With Aspirin Is Enhanced by Prehospital Administration

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The benefit of lytic therapy is strongly dependent on its early administration. However, there are conflicting data regarding a time-dependent effect of aspirin on outcome of AMI patients. Methods: We studied 943 consecutive ST-segment elevation AMI patients in Killip class I-III on admission. Patients were divided into 2 groups based on timing of aspirin administration: before (early aspirin) or after (late aspirin) hospital admission. Results: Early aspirin users (n=338; 36%) were younger (61±13 versus 65±14 years old, p<0.001), less likely to be women (17% versus 27%, p<0.001), and more likely to smoke (47% versus 38%, p=0.006) than late users (n=605; 64%). Other baseline and clinical characteristics were similar. Early aspirin users were more likely to be treated with thrombolysis (53% versus 43%, p=0.002) or primary PTCA (13% versus 9%, p=0.04). Compared with late users, early aspirin users had significantly lower mortality rates at 7 days (2% versus 7%, p=0.002) and 30 days (5% versus 12%, p<0.001). By multivariate anaysis, pre-hospital aspirin was an independent determinant of survival at 7 days (odds ratio 0.44; 95% confidence interval 0.18-0.94) and at 30 days (odds ratio, 0.30-1.01; 95% confidence interval 0.30-1.01). Outcome benefit from pre-hospital aspirin persisted for reperfusion-treated and untreated patients. Conclusions: Survival of MI patients treated with aspirin is enhanced by pre-hospital administration. Yet, only 36% of AMI patients receive aspirin before hospital admission. Our findings should encourage education of the medical community concerning the importance of administering aspirin as soon as possible after onset of AMI symptoms.