1073-93 Performance of an Automated External Cardiovcrter Defibrillator for In-Hospital Ventricular Malignant Arrhythmia

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Purpose: Ventricular fibrillation (VF) and ventricular tachycardia (VT) are the major underlyng arrhythmies during in-hospital cardiac arrest. For a patient in VF/VF the probability of successful defibrillation and subsequent survival to hospital discharge is directly and negatively related to the time interval between onset of the arrhythmia and delivery of the first shock. The data about this interval in clinical practice is heterogeneous and inconsistent, however the literature estimates it to be about 60 seconds in monitored units. Continuous ECG monitoring allows identification of such arrhythmias and alert nursing and medical staff. The time delay between the arrhythmia event and human intervention is still a challenge for clinical practice.

Methods: We reported the use of an automated external cardioverter defibrillator (AECD) in 45 patients considered to be at higher risk for malignant arrhythmia for 24 to 48 hours. The inclusion criteria was acute coronary syndrome, cardiogenic shock and previous episode of sudden cardiac arrest. The exclusion criteria was the presence of malignant arrhythmias, history of pacemaker, and outpatient setting. AECD was approved by the FDA for in-hospital use. The AECD can be programmed to automatically defibrillate a life threatening ventricular arrhythmia. The continuous ECG monitoring allows identification of such arrhythmias and alert nursing and medical staff. The time delay between the arrhythmia event and human intervention is still a challenge for clinical practice.

Results: Staff vs AECD response time to arrhythmia (seconds) was 33.3 ± 6.9 (range 21 to 65 s). The sensitivity and specificity were 100%. The success of the defibrillation was 84.14% (16/19) for the first shock and 100% (1/1) for the second shock. There was no adverse event during the study period and no episodes of inappropriate therapy delivery (the detection was accurate in all episodes - sensitivity 100%).

Conclusion: AECD was safe and effective. It presents the possibility of providing consistently rapid identification and response to ventricular malignant arrhythmia.

1073-94 The Potential Impact of a Fully Automated External Cardiovcrter Defibrillator in Centrally Monitored Hospital Units

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Background: Sudden Cardiac Arrest (SCA) survival decreases by 10% for each minute of delay in cardioversion, with survival rates of 98% noted when defibrillation is achieved within 30 seconds of collapse. This has led to increasing use of semi-automated external defibrillators in many out-of-hospital settings. Recently, a fully automated external cardioverter-defibrillator (AECD) was approved by the FDA for in-hospital use. The AECD can be programmed to automatically defibrillate a life threatening ventricular arrhythmia. The purpose of this study was to assess the potential impact of AECDs on the critical time to defibrillation in monitored hospital units.

Methods: Mock codes (n=18) were conducted using simulated ventricular fibrillation in various monitored units. Observers were stationed to record the time staff responded to the arrhythmia, and the time to shock. These times were compared to an AECD protocol that automatically defibrillates at an average of 38.3 seconds from onset of arrhythmia (n=18).

Results: Staff vs AECD response time to arrhythmia (seconds) was 76.3 ± 113.7 (CI 19.8 - 132.8) vs 7.6 ± 0.6 (CI 7.3 - 7.9). Staff vs AECD time to shock was 169.2 ± 103.1 (CI 117.9 - 220.4) vs 38.3 ± 0.7 (CI 37.9 - 38.6). p values are < 0.0001 for differences between the groups.

Conclusion: Immediate Defibrillation Predicts Probability of Defibrillation Curve Width for External Defibrillation Waveforms

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Background: Defibrillation is either immediate (ID) or progressive, i.e. followed by extrasystoles before termination, but significance of ID remains unknown. Waveforms having large probability of success (POS) curve width are poor for defibrillation because outcome is uncertain over a large shock intensity range. We tested the hypothesis that waveforms having primarily ID at 50% (current for 50% success) have narrow POS curve width.

Methods: POS curves were obtained in 21 isolated rabbit hearts using monophasic damped sine (MDS), and monophasic and biphasic truncated exponential (BTE) waveforms with large or small epicardial patches. Fibrillation and defibrillation type were recorded using monophasic action potential electrodes. Normalized POS curve width, defined as (I0-I00)/I50 (MD), and POS probability at 50% were determined. Results: Each waveform/electrode combination yielded a single point on the normalized curve vs %ID curve. Probability of ID at I50 ranged from almost 0% for MDS with small electrodes to 100% for BTE with large electrodes. Probability of ID at I50 closely correlated with normalized curve width (R2 = 0.97, figure). Conclusion: The finding that a high probability of immediate defibrillation in low regions of the POS curve correlates with narrow defibrillation POS curves may lead to improved waveform/electrode combinations that will enhance defibrillation success.

Poster Session 1074 Outcomes in Coronary Bypass Surgery Subsets

Monday, March 31, 2003, 9:00 a.m.-11:00 a.m.
McCormick Place, Hall A
Presentation Hour: 9:00 a.m.-10:00 a.m.

1074-95 Platelet Glycoprotein Ilb/IIIa Antagonists Are Beneficial in Patients With Acute Coronary Syndromes Who Undergo In-Hospital Coronary Artery Bypass Surgery

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Background: The use of platelet glycoprotein IIb/IIIa receptor antagonists (GP IIb/IIIa) in non-ST segment elevation acute coronary syndromes (ACS) is widely accepted, especially for percutaneous coronary intervention. However, their efficacy in patients undergoing in-hospital coronary artery bypass grafting (CABG) is not well established.

Methods: We performed a pooled analysis of 4 large-scale, placebo-controlled, IIb/IIIa ACS trials, namely PURSUIT, GUSTO IV, PARAGON A, and PARAGON B, and addressed outcomes among patients undergoing in-hospital CABG (N=3166) according to treatment allocation. Results: Reported in the table.

Conclusions: The use of IIb/IIIa inhibitors among patients with ACS undergoing in- hospital CABG is associated with a benefit that persists at 6 months.