

precordial compressions, increased to $1.9 \pm 0.3\%$. The ETCO_2 rapidly increased to $4.9 \pm 0.3\%$ in those animals successfully resuscitated (17 of 22) 13 minutes after arrest. The relationship between cardiac output and ETCO_2 was direct and closely correlated ($r = .95$) in both this study and a similar five-animal experiment using open-chest cardiac massage. In addition, highly significant differences in ETCO_2 were observed during CPR between animals that were resuscitated successfully (ETCO_2 , $1.7 \pm 0.2\%$; 17 of 22 animals) and those that were not (ETCO_2 , $0.5 \pm 0.1\%$; five of 22 animals) ($P < .001$). Measuring ETCO_2 during CPR provided a simple, noninvasive method of assessing the efficacy of precordial compressions and the cardiac output generated, as well as prognosticating outcome and identifying restoration of spontaneous circulation.

Michael Christopher, MD

esmolol, beta blockers, cardiac drugs

Esmolol, the first ultra-short-acting intravenous beta blocker for use in critically ill patients

Blanski L, Lutz J, Laddu A
Heart Lung 17:80-89
Jan 1988

This review article summarizes the clinical indications, side effects, pharmacokinetics, and dynamics of esmolol, the only ultra-short-acting beta blocker currently available. It is relatively beta-1 selective with no significant side effects in mild asthmatics and chronic obstructive pulmonary disease patients. It is metabolized rapidly by erythrocyte esterases with only 2% of the drug excreted unchanged in urine, making its clearance different than all other beta-blocking agents. The byproducts of its metabolism are an acid metabolite and methanol, with methanol levels being less than 2% of those found in methanol toxicity. Its half-life is two minutes. Clinically it produces a decrease in heart rate, systolic and diastolic blood pressures, left ventricular ejection fraction, and cardiac index within five minutes. In one study, patients with significant coronary artery disease and impaired left ventricular function showed decreased left ventricular ejection fraction and elevated pulmonary capillary wedge pressure with esmolol, but worsening of congestive heart failure did not accompany these hemodynamic changes. Effects on heart rate occur at lower doses than those that interfere with hemodynamic parameters, allowing the drug's effect to be titrated clinically. Studies show a return to baseline parameters within ten to 30 minutes after discontinuation of the drug. Side effects include hypotension (a significant problem when used with IV nitroglycerin), bronchospasm, nausea, and rare central nervous system effects. Clinical indications for its use include supraventricular tachycardia; studies have shown it to be comparable with propranolol but with a shorter duration of action. It also has been shown to be as effective as ve-

rapamil in control of atrial fibrillation and flutter with significantly less hypotension. Other uses include control of perioperative tachycardia and hypertension in patients with coronary artery disease and those undergoing carotid endarterectomy. In comparison with nitroprusside, it was comparable for control of hypertension without the reflex tachycardia associated with nitroprusside.

Cheryl Melick, MD

myocardial contusion, creatine phosphokinase

Myocardial contusion in blunt trauma: Clinical characteristics, means of diagnosis, and implications for patient management

Fabian TC, Mangiante EC, Patterson CR, et al
J Trauma 28:50-57
Jan 1988

Confusion exists concerning the incidence, characteristics, and impact on management of cardiac contusions. All patients ($N = 1,100$) admitted to a Level I trauma center with blunt trauma during a 12-month period were prospectively evaluated for myocardial contusion with study criteria for cardiac injury including anterior chest wall contusions, sternal or anterior rib fractures, or pain/tenderness of the anterior chest ($n = 140$, 13%). Patients meeting criteria underwent immediate and daily ECGs and serial creatine phosphokinase (CPK) isoenzymes for 24 hours. A diagnosis of myocardial contusion was made if CPK-MB was 5% or more of the total CPK, or an abnormal admission ECG reverted to normal by discharge. Thirty patients (54%) were positive by CPK alone, 23 (41%) by both CPK and ECG, and three (5%) by ECG alone. Of the 53 with increased CPK-MB, 14 (26%) were normal on admission with the remainder becoming positive within 24 hours. Two-dimensional echocardiography was abnormal in only three of 21 positive patients and gated ventricular angiography was abnormal in only three of 40 positive patients. No significant arrhythmias developed under general anesthesia during surgical procedures.

Cynthia Elliott, MD

status asthmaticus, aminophylline

Aminophylline treatment in severe, acute asthma

Littenberg B
JAMA 259:1678-1684
Mar 1988

Meta-analysis, a type of structured review, was used to answer the question, "Is IV aminophylline beneficial in the