

Abstracts

Compiled by: Journal Staff

Pulmonary Barotrauma During Cardio-pulmonary Resuscitation

HILLMAN K, ALBIN M

Critical Care Medicine 14: 606-609, 1986

Four case studies of pulmonary injury attributed to artificial ventilation during CPR are presented. Several problems leading to dangerously high peak airway pressures are revealed, including a faulty one-way valve on a ventilation device, vigorous chest compressions, and bag ventilations without airway pressure limiting valves. Discussion is given to the mechanics of barotrauma and the pathophysiology of its consequences. The authors suggest pulmonary barotrauma may be an underestimated complication of resuscitation. Caution is given against simultaneous compression and ventilation as it may cause sufficient peak inspiratory pressure to cause barotrauma. A recommendation is made to require that CPR equipment have airway pressure limiting valves. Clinicians are urged to look for signs of barotrauma during CPR and to consider X-ray after CPR to exclude mediastinal emphysema and pneumothorax.

Glucagon Reversal of Hypotension in a Case of Anaphylactoid Shock

ZALOGA GP, DELACEY W, HOLMBOE E, CHERNOW B

Annals of Internal Medicine 105: 65-66, 1986.

A case report and discussion are given for a 75 year old patient who developed hypotension, diaphoresis, urticaria and complained of itching within minutes following injection of radiocontrast dye for CT scan. CT was to be performed as part of evaluation of vertigo. This patient had a past history of angina, and essential hypertension with prescription medications including atenolol. The patient was given a 1mg. bolus of epinephrine, IV, with minimal improvement in blood pressure. This poor response suggested presence of beta-blockade. Five minutes following the epinephrine, a 1 mg. bolus of glucagon was given. The MAP increased from 55 to 75 mm Hg and later went back down to 60 mm Hg. Another 1 mg. dose of glucagon was given along with Methylprednisolone and Diphenhydramine and initiation of a glucagon drip at 1mg./hr. These interventions restored and maintained normal arterial pressure. Glucagon infusion was gradually discontinued. The patient was observed for 24 hours and discharged. Discussion is made of epinephrine and possible ineffectiveness in patients taking beta-blockers. Glucagon has potent inotropic and chronotropic actions that are only minimally antagonized by beta blockers. The authors conclude glucagon may be effective in arousal of anaphylactic hypotension in patients taking beta-blockers.

Wide Complex Tachycardia: Misdiagnosis and Outcome After Emergent Treatment.

STEWART RB, BARDY GH, GREENE HL

Annals of Internal Medicine 104: 766-771, 1986.

The problem of differential diagnosis between ventricular and supraventricular tachycardia with wide QRS complexes in 12 lead ECG analysis were studied in 46 consecutive episodes of wide QRS complex tachycardia (QRS > .12 sec., rate > 100 beats/min.). The mechanism of tachycardia, ventricular or supraventricular, was later established by programmed stimulation, esophageal leads or other electrophysiologic studies. Of the 46 wide QRS complex tachycardia episodes, 8 were found to be supraventricular and 38 were ventricular tachycardias. Supraventricular tachycardia with aberrant conduction was correctly diagnosed in 8 of 8 episodes (100%). Ventricular tachycardia was correctly diagnosed in 23 of 38 episodes (61%). Ventricular tachycardia was misdiagnosed in 15 of 38 episodes (39%). Ventriculoatrial dissociation was apparent in 11 of the 15 misdiagnosed tracings. Misdiagnosis 13 of 15 cases

lead to administration of verapamil, all of which suffered significant clinical deterioration. This investigation lead to conclusions that wide QRS complex tachycardia is often misdiagnosed by 12 lead ECG, that when a tachycardia is of ventricular or uncertain origin, verapamil is potentially dangerous, and that tachycardia of uncertain origin should be treated as ventricular tachycardia until proven otherwise. Request reprints from Gust H. Brady, M.D., Division of Cardiology, Harborview Medical Center, 325 Ninth Avenue, Seattle, WA 98104.

A Method For Evaluating Field Triage Criteria

WEST JG, MURDOCK MA, BALDWIN LC, WRALEN T

Journal of Trauma. 26: 655-659, 1986

A retrospective study was conducted on the Orange County, California, EMS system to determine rates of over and under triage of patients to trauma centers. Overtriage was defined as cases in which the patient was hospitalized for less than 3 days and in which their ISS score was later found to be either less than 10 or 15, depending on which study protocol was used. Undertriage was defined as a ratio of non-CNS MVA deaths in non-trauma center hospitals divided by the total number of non-CNS deaths times 100. The study included all paramedic responses from August 1983 through July 1984. Two different field triage criteria were employed, differing in their sensitivity in detecting potentially serious injuries and in their rates of over and undertriage. Discussion provides insight into how medical control might attempt to balance items included in field triage criteria to obtain acceptable sensitivity of serious injuries needing trauma center care while minimizing the political and economic consequences of overtriage of less severe cases past appropriately capable non-trauma center hospitals. Request reprints from John West, M.D., 1310 W. Stewart Dr., Suite 603, Orange, CA 92668

Preventable Trauma Deaths: Dade County, Florida.

KRIES DJ, GUSTAVO P, AUGENSTEIN P, et al.

Journal of Trauma 26: 649-654, 1986.

All trauma deaths for 1982 in Dade County, Florida were retrospectively examined by a panel of at least four full-time trauma surgeons from the University of Miami/Jackson Memorial Medical Center. Their objective was to evaluate the need for an organized trauma network. There were 1,201 total cases, of which 715 (59.5%) were dead on the scene. The remaining 486 cases included 240 (49.4%) deaths resulting from CNS injury and were excluded from further study. This study concentrated on the 246 (50.6%) non-CNS cases in which death occurred after transport from the scene. The panel determined 52 (21.1%) of the non-CNS deaths were preventable. Failure to perform a procedure or a delay in surgery accounted for 43 (82.7%) of these preventable deaths. The lone Level 1 trauma center in operation in 1982 had a non-CNS preventable mortality rate of 12.1%. The non-CNS preventable mortality rate for the 22 non-trauma centers was 26.4% ($p < 0.01$). The authors conclude that severely injured patients should be triaged directly to trauma centers and that an organized trauma center for Dade County, Florida is justified.

Trauma Center Verification

MAULL KI, SCHWAB CW, MELLENEY SD, et al.

Journal of Trauma 26: 521-524, 1986.

This paper describes a process used in the state of Virginia to verify the performance of trauma centers, 2 years following their formal designation. Designation had concentrated on capabilities whereas verification centers upon performance following designation. This verification process attempted to

measure institutional commitment, assess deficiencies and give valid peer review. Verification criteria were based on the 1983 American Colleges of Surgeons Guidelines for Hospital and Prehospital Trauma Resources. The verification was conducted by a multidisciplinary team with surgical, emergency medicine, critical care nursing and hospital administration representation. The verification site visit, after documentation review, required one half day. Site visit activities include a tour, chart reviews and interviews with residents, nurses, emergency medical technicians and anesthesia personnel. Failure of verification results in a re-visit in 6 months to check for correction of deficiencies. Failure at revisitation results in formal notification to the hospital and all concerned agencies within the region. The authors conclude that its verification program has been successful in sustaining the momentum of improvements in trauma care. Request reprints from Kimball Maull, M.D., Dept. of Surgery, University of Tennessee, 1924 Alcoa Highway, Knoxville, TN 37520.

Esophageal Intubation: A Review Of Detection Techniques.

BIRMINGHAM PK, CHENEY FW, WARD RJ
Anesthesia and Analgesia 65: 886-891, 1986

A collective review was conducted of techniques used to detect inadvertent esophageal intubation during efforts to intubate the trachea. This paper reveals that esophageal intubation has been a significant factor in anesthesia related deaths. Each of the many available techniques for confirmation of tube placement are separately discussed, outlining their respective strengths and limitations. Strongly favored in this review were the direct visualization of tube passage through the vocal cords and measurement of carbon dioxide in exhaled gases by an on-line gas analyzer, such as a capnograph or mass spectrometer. The expired gas method works on the basis that CO₂ is present in exhaled gases but is not present in escaping esophageal gases. The authors advocate use of on-line CO₂ analysis as a technique to be employed routinely, wherever possible.

Acute Cardiac Events Temporarily Related to Cocaine Abuse

ISNER JM, ESTES N, THOMPSON PD, et al
New England Journal of Medicine 315:1438-1443, 1986.

Case reports and discussion are used to explore the intranasal complications of recreational cocaine abuse. Their evidence contradicts commonly held notions among many physicians that cocaine taken by the intranasal route is safe. The authors conclude that 1) Cardiac consequences of abuse can occur with intranasal administration 2) Underlying heart disease is not a prerequisite for cardiac complications of cocaine abuse 3) Seizure activity can occur without cardiac toxicity from cocaine 4) Cardiac consequences are not limited to massive doses. The authors suggest the medical consequences of abuse are of equal importance to the well documented psycho-social consequences. Request reprints from Jeffery Isner, MD, Tufts-New England Medical Center, 171 Harrison Ave, Box 70, Boston, MA 02111.

Ventilation Skills of Emergency Medical Technicians: A Teaching Challenge for Emergency Medicine

CUMMINS RO, AUSTIN D, GRAVES JR, LITWIN PE, PIERCE J
Annals of Emergency Medicine 15: 1187-1192, 1986.

Concern has been expressed in the medical literature regarding the ability of basic emergency medical technicians (EMTs) to adequately ventilate non-intubated cardiac arrest victims with a bag-valve-mask device. A study was made of 64 EMTs, most of which were full-time paid firefighters, during previously scheduled continuing education classes. Their skills in ventilation were assessed with a calibrated recording CPR manikin using a bag-valve-mask in comparison to pocket mask devices while chest compressions were in progress. In a preliminary skills assessment, it took an average of 4.8 ventilation attempts to make the manikin flash its green light, indicating adequacy with an 800ml or greater tidal volume. This is in contrast to an average of only 2.9 attempts required for the pocket mask (P<.01). In a two minute skills test, bag-valve-mask ventilation averaged 8.3 adequate ventilations per minute versus 9.9 per minute with the pocket mask (P<.01). In an extended ten minute test, there were no significant differences between the two methods. The authors conclude that specific performance objectives of at least 10 ventilations per minute of at least 800ml each be required during chest compressions. Given the demonstrated ability of EMTs to learn other sophisticated medical skills, the bag-valve-mask should not be removed from the EMT armamentarium. Request reprints from Douglas Austin, King County EMS, Room 508, Smith Tower, 506 2nd Ave., Seattle, WA 98104

Environmental Concentrations of Nitrous Oxide in a Modular Ambulance.

BRISTOW A, GIESECKE AH, THAL E, ATKINS J
Critical Care Medicine 14: 815-816, 1986.

The prehospital administration of 50% nitrous oxide with 50% oxygen has demonstrated analgesic efficacy in a variety of traumatic and medical conditions. However, concern exists over the hazards it may pose to prehospital medical personnel in the confines of an ambulance, in terms of impaired clinical skills, fetal defects (if attendant is pregnant) and various malignancies. The concentrations of nitrous oxide in various locations of a type I ambulance were measured during patient care by an on-line infrared spectrophotometer in the ambulance while stationary at the scene and in transport, with and without operation of the air conditioning (AC) units. The rear patient compartment windows were open in both cases. The maximum time weighted concentration of nitrous oxide recommended by the National Institute for Occupational Safety and Health is 25 parts per million (PPM). On the bench seat beside the patient without AC, the nitrous oxide levels reached 238 and 243 PPM stationary and in transit, respectively. With the AC, the concentrations reached 56 and 52PPM stationary and in transit, respectively. The authors conclude that patient compartment levels of nitrous oxide may exceed maximum recommended levels. They recommend that the AC blower fan be used whenever nitrous oxide is administered and that a scavenger system be developed to prevent high ambient nitrous oxide levels. Request reprints from Dr. AH. Giesecke, Department of Anesthesiology, University of Texas Southwestern Medical School at Dallas, 5201 Harry Hines Boulevard, Dallas TX 75235.