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Abstracts

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Complications from IV Therapy: Results from Field-Started and Emergency Department-Started IV's Compared

LAWRENCE DW, LAURO AJ

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A two month study was made of metropolitan hospital IV complication rates in two groups - Group A (N=82) had their IV started in the field by EMT-I or EMT-P's; Group B (N=109) had IV's initiated in the emergency department. Only patients admitted to general wards, as opposed to intensive care areas, were studied because cases with field started IV's are immediately replaced if brought into the ICU. All IV sites were at or distal to the antecubital area, using plastic catheters of several gauges and lengths. Patients were matched between groups for age, admitting diagnosis, IV fluid and medication, and other parameters. IV complications were characterized as phlebitis (local) or fever (systemic). The prehospital group (group A) had a 34% incidence of phlebitis versus 7% for the emergency department group (group B)($p < .001$). For fever, group A cases had a 22% incidence versus 4% from group B ($p < .01$). The authors claim the results support the hypothesis that prehospital IV therapy poses greater risk of complication compared to the emergency department. They suggest investigation into measures to improve aseptic technique in the field, such as cleaning the clinicians hands with alcohol based foam or wearing gloves. They suggest prehospital lines be replaced as soon as possible after hospital arrival. Suggestion is made that the catheter movement inherent to the prehospital phase during transportation may be a non-contamination cause of the observed prehospital phlebitis. The authors conclude the risk/benefit ratio should be considered in selecting patients for prehospital IV therapy. Reprints: Albert J. Lauro, MD, Emergency Medical Services, Charity Hospital, Room 1812, 1532 Tulane Ave., New Orleans, LA 70140

Hypokalemia and Out-of-Hospital Cardiac Arrest

FEDMAN R, WHITE RD

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Case histories of four patients and discussion are provided on the topic of hypokalemia as a possible etiologic factor in out-of-hospital cardiac arrest. The authors suggest that hypokalemia may have been a precipitating factor or even solely responsible for these arrests. All patients studied were found to have a low initial serum potassium level (2.4-2.8 mEq/L - normal range 3.6-4.8 mEq/L). All cases were defibrillated, 3 received CPR, 3 received lidocaine, 1 received epinephrine, none received sodium bicarbonate. The authors assert that the literature does not support the idea of defibrillation or CPR influencing serum potassium levels. Epinephrine can cause transient hypokalemia. The one patient who received epinephrine had hypokalemia persisting for over 24 hours post-arrest, minimizing the possibility of it as the cause. In 2 of the cases, myocardial infarction was identified. The dysrythmia generating potential for MI is well known, but it might have been further compounded by hypokalemia. Two patients did not have MI. Both were on diuretics, which may have caused the hypokalemia. The authors conclude that hypokalemia may be a pre-existing disorder, not induced by resuscitation. The potential role of prehospital potassium administration is discussed, but dismissed for lack of technology to make field measurements of serum potassium levels.

Oxygen Enrichment of Bag-Valve-Mask units During Positive Pressure Ventilation: A Comparison of Various Techniques

CAMPBELL TP, STEWART RD, KAPLAN RM, et al

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The delivered oxygen concentration from a Laerdal bag resuscitator was tested during ventilation of a mechanical test lung at high (0.1) and low (0.01) compliances with ventilation rates 12 and 20 per minute. Oxygen concentration was measured with an on-line analyzer. At 12 ventilations per minute, rapid refilling by spontaneous bag expansion and slow refilling over a 3-4 second period was employed. At 20 per minute, only rapid refilling could be used due to the limited time between ventilations. Oxygen enrichment to the intake of the bag was made by three different methods - supplemental oxygen supply at 15 L/min with a 100 ml reservoir tube, a 2.5 L reservoir bag or attachment of a demand valve resuscitator directly to the bag refill port. In their results, compliance and tube reservoir size were not significant variables to the delivered oxygen concentration. At 12 ventilations per minute, delivered oxygen concentration was 82% with the tube reservoir, 100% with the reservoir bag and 100% with the demand valve. The demand valve consumed less oxygen from the cylinder than the other methods. The authors found the slow bag refill technique to increase the delivered oxygen concentration when using a tube reservoir, but assert that the inconvenience should not be imposed upon field clinicians. They recommend that the 2.5 L bag reservoir or the demand valve be used. Further, caution must be used with the demand valve when attached to the bag to prevent inadvertent manual triggering during patient exhalation, as it may cause dangerous levels of PEEP. Reprints: Ronald D. Stewart, MD, FACEP, Department of Emergency Medicine, University of Toronto / Sunnybrook Medical Center, 2075 Bayview Ave., B-G 315, Toronto, Ontario, Canada M4N3M5