DOGMA DETECTIVES Case #03-07-13-01: ARRESTING ALCHEMY

Epinephrine is routinely administered during resuscitative efforts during cardiac arrest.

Does it have a benefit in increasing the rate of ROSC (return of spontaneous circulation)? More importantly --- does the current literature show that more patients walk out of the hospital neurologically intact as a result of epi use?

This blinded randomized controlled trial from JAMA in 1992 studied standard dose epinephrine, high dose epinephrine, and an epi-norepinephrine combination. Higher doses of epinephrine were associated with an increased ROSC, however had no effect on survival to hospital discharge, nor positive neurological outcome.
http://jama.jamanetwork.com/article.aspx?articleid=401309

This blinded randomized control trial from the Lancet in 2001 studied vasopressin compared to epinephrine for in-hospital cardiac arrests, showing no difference in survival to hospital discharge between the groups. There was no neurologic benefit either, based on results of the mini-mental status exam. The authors concluded that the AHA guidelines recommending vasopressin as an alternate therapy to epinephrine are not congruous with their findings.
http://europepmc.org/abstract/MED/11463411

This retrospective review presented in JAMA in 2009 looked at patients that received IV medications during their care, compared to those that did not based on lack of IV access. Patients with IV access and drug administration had higher rates of short-term survival, but no statistically significant improvement in survival to hospital discharge, quality of CPR, or long-term survival.
http://jama.jamanetwork.com/article.aspx?articleid=184947

This double-blind randomized trial published in Resuscitation in 2011 mirrors the same findings of the studies above. In this trial, paramedics in Western Australia were given syringes that held either the standard 1 mg dose of 1:10,000 epinephrine or a placebo (0.9% NSS). While the patients that received epinephrine did have increased rates of ROSC, there was no statistically significant difference in survival to hospital discharge, or functional neurologic recovery.
http://www.resuscitationjournal.com/article/S0300-9572(11)00405-9/abstract

However, it is important to note that there was a positive trend seen, and that twice as many patients who received epinephrine in this study survived compared to saline (11 vs. 5). Two of the patients that survived in the epinephrine group had a poor neurologic outcome, so 9 patients who received epinephrine and 5 patients who received saline left the hospital neurologically intact.

There are no studies that demonstrate harm from epinephrine administration. With the new CPR guidelines, concentration on better cardio-cerebral resuscitation, and post-arrest hypothermia care, it is possible that the positive trend seen in the Resuscitation study may move more towards statistical significance.

Further studies need to be completed. There MAY be a benefit to the use of epinephrine in cardiac arrest, but it is still INCONCLUSIVE. Concentration on good CPR, early defibrillation, and de-emphasis (but not discontinuation) of drug therapy is the best recommendation at the current time.