Compare vasopressin, amiodarone, and epinephrine administration by sternal intraosseous (SIO), tibial intraosseous (TIO), and intravenous (IV) routes in a swine model of cardiac arrest”

Abstract:

OBJECTIVE: Compare vasopressin, amiodarone, and epinephrine administration by sternal intraosseous (SIO), tibial intraosseous (TIO), and intravenous (IV) routes in a swine model of cardiac arrest.

DESIGN: Prospective, randomized, between subjects, experimental design.

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SETTING: Laboratory.

SUBJECTS: Male Yorkshire-cross swine (N = 35), seven per group.

INTERVENTION: Swine were randomized to SIO, TIO, IV, cardiopulmonary resuscitation (CPR) with defibrillation, or CPR-only groups. Ventricular fibrillation (VF) was induced under general
anesthesia. Mechanical CPR began 2 minutes postarrest. Vasopressin (40 U) was administered to the SIO, TIO, and IV groups 4 minutes postarrest. Defibrillation was performed and amiodarone (300 mg) was administered 6 minutes postarrest. Defibrillation was repeated, and epinephrine (1 mg) was administered 10 minutes postarrest. Defibrillation was repeated every 2 minutes and epinephrine repeated every 4 minutes until return of spontaneous circulation (ROSC) or 26 postarrest minutes elapsed.

MAIN OUTCOME MEASURES: Rate of ROSC, time to ROSC, and odds of ROSC.

RESULTS: There were no significant differences in rate of ROSC between the SIO and TIO (p = 0.22) or IV groups (p = 1.0). Time to ROSC was five times less in the SIO group than the TIO group (p = 0.003) but not compared to IV (p = 0.125). Time to ROSC in the IV group was significantly less than the TIO group (p = 0.04). Odds of ROSC for the SIO group were five times higher compared to the TIO group but same as IV. Odds of ROSC in the IV group were higher than the TIO group.

CONCLUSION: There was a statistically significant delay in the time to ROSC and a clinically significant difference in odds of ROSC when resuscitative drugs, including lipophilic amiodarone, were administered by the TIO route compared to the SIO and IV routes in a swine model of sudden cardiac arrest. Further investigations are warranted to isolate the mechanism behind these findings.

Reference:


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