Compare maximum concentration (Cmax), time to maximum concentration (Tmax), mean serum concentration of vasopressin, return of spontaneous circulation (ROSC), time to ROSC, and odds of survival relative to vasopressin administration by tibial intraosseous (TIO), humerus intraosseous (HIO), and intravenous (IV) routes in a hypovolemic cardiac arrest model" Adams et al (2016).

Abstract:

OBJECTIVE: Compare maximum concentration (Cmax), time to maximum concentration (Tmax), mean serum concentration of vasopressin, return of spontaneous circulation (ROSC), time to ROSC, and odds of survival relative to vasopressin administration by tibial intraosseous (TIO), humerus intraosseous (HIO), and intravenous (IV) routes in a hypovolemic cardiac arrest model.

DESIGN: Prospective, between subjects, randomized experimental design.

SETTING: TriService Research Facility.

SUBJECTS: Yorkshire-cross swine (n = 40).

INTERVENTION: Swine were anesthetized, exsanguinated to a Class III hemorrhage, and placed into cardiac arrest. After 2 minutes, cardiopulmonary resuscitation was initiated. After an additional 2 minutes, a dose of 40 units of vasopressin was administered by TIO, HIO, or the IV routes. Blood samples were collected over 4 minutes and analyzed by high-performance liquid chromatography tandem mass spectrometry.

MAIN OUTCOME MEASUREMENTS: ROSC, time to ROSC, Cmax, Tmax, mean

concentrations over time, and odds ratio.

RESULTS: There was no significant difference in rate of ROSC or time to ROSC between the TIO, HIO, and IV groups ($p > 0.05$). The Cmax was significantly higher in the IV group compared to the TIO group ($p = 0.015$), but no significant difference between the TIO versus HIO or HIO versus IV groups ($p > 0.05$). The Tmax was significantly shorter for the HIO compared to the TIO group ($p = 0.034$), but no significant differences between the IV group compared to the TIO or HIO groups ($p > 0.05$). The odds of survival were higher in the HIO group compared to all other groups.

CONCLUSION: The TIO and HIO provide rapid and reliable access to administer life-saving medications during cardiac arrest.

Reference:

Adams, T.S., Blouin, D. and Johnson, D. (2016) Effects of tibial and humerus intraosseous and intravenous vasopressin in porcine cardiac arrest model. American Journal of Disaster Medicine. 11(3), p.211-218.

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