



To compare the effects of amiodarone administration by humerus intraosseous (HIO) and intravenous (IV) routes on return of spontaneous circulation (ROSC), time to maximum concentration (Tmax), maximum plasma drug concentration (Cmax), time to ROSC, and mean concentrations over time in a hypovolemic cardiac arrest model” Holloway et al (2016).

Abstract:

OBJECTIVE: To compare the effects of amiodarone administration by humerus intraosseous (HIO) and intravenous (IV) routes on return of spontaneous circulation (ROSC), time to maximum concentration (Tmax), maximum plasma drug concentration (Cmax), time to ROSC, and mean concentrations over time in a hypovolemic cardiac arrest model.

DESIGN: Prospective, between subjects, randomized experimental design.

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SETTING: TriService Research Facility.

SUBJECTS: Yorkshire-cross swine (n = 28).

INTERVENTION: Swine were anesthetized and placed into cardiac arrest. After 2 minutes, cardiopulmonary resuscitation was initiated. After an additional 2 minutes, amiodarone 300 mg was administered via the HIO or the IV route. Blood samples were collected over 5 minutes. The samples were analyzed using high-performance liquid chromatography tandem mass spectrometry.

MAIN OUTCOME MEASUREMENTS: ROSC, Tmax, Cmax, time to ROSC, and mean concentrations over time.

RESULTS: There was no difference in ROSC between the HIO and IV groups; each had five achieve ROSC and two that did not ($p = 1$). There was no difference in Tmax ($p = 0.501$) or in Cmax between HIO and IV groups ($p = 0.232$). Means \pm standard deviations in seconds were 94.3 ± 78.3 compared to 115.7 ± 87.3 in the IV versus HIO groups, respectively. The mean \pm standard deviation in nanograms per milliliter for the HIO was $49,041 \pm 21,107$ and $74,258 \pm 33,176$ for the IV group. There were no significant differences between the HIO and IV groups relative to time to ROSC ($p = 0.220$). A repeated analysis of variance indicated that there were no significant differences between the groups relative to concentrations over time ($p > 0.05$).

CONCLUSION: The humerus intraosseous provides rapid and reliable access to administer life-saving medications during cardiac arrest.

Reference:

Holloway, C.M., Jurina, C.S., Orszag, C.J., Bragdon, L.G., Green, L.R., Garcia-Blanco, J.C., Benham, B.E., Adams, L.T. and Johnson, D. (2016) Effects of humerus intraosseous versus intravenous amiodarone administration in a hypovolemic porcine model. *American Journal of Disaster Medicine*. 11(4), p.261-269.

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