Effects of Polyethylene Glycol-20k on Post-Resuscitation Survival and Neurological Function in a Rat Model of Cardiopulmonary Resuscitation

J. Yang1, C. Miao1, Y. Xiao1, W. Huang1, Z. Hu1, Q. Gao1, X. Wu1, J. Bradley1, MA Peberdy1,2,1, JP Ornato1,3, MJ Mangino3,6,7 and W. Tang1,3,4

1Weil Institute of Emergency and Critical Care Research at VCU, VA 2Department of Internal Medicine, VCU, VA 3Department of Emergency Medicine, VCU, VA 4Sun Yat-sen Memorial Hospital, SunYat-sen University, Guangzhou, P.R China 5Department of Respiratory Medicine, The Second Hospital of Anhui Medical University, Hefei, PR China 6Department of Surgery, VCU, VA, 7Department of Physiology and Biophysics, VCU, VA

Background
Polyethylene Glycol-20k (PEG-20k) is a hybrid cell impermeant that produces non-energy dependent water transfer in the microcirculation and improves microcirculatory flow after low flow states. Reduced cell swelling, improved myocardial function, and survival have been demonstrated in a hemorrhagic shock model. The effects of PEG-20k on survival and neurological function after cardiac arrest are unknown. We hypothesized that administration of PEG-20k during CPR improves survival, and neurologic function in a rat model of cardiac arrest.

Methods
Ventricular fibrillation was induced in 20 male Sprague-Dawley rats and left untreated for 6 min. Animals were randomized into two groups of 10: PEG-20k and control. PEG-20k (10%, 2ml) and vehicle (saline) were administered in equal amounts at the beginning of CPR by continuous intravenous infusion. Defibrillation was attempted after 8 min of CPR. Survival was recorded at 24, 48, and 72 hours after resuscitation. Neurological deficit scores were recorded at 24, 48, and 72 hours PR.

Results
All animals were resuscitated successfully. Survival was significantly improved in animals receiving PEG-20k (p<0.05, Figure 1). Post resuscitation cerebral function (p<0.05, Figure 2) was also significantly improved in animals treated with PEG-20k.

Conclusions
Administration of PEG-20k during CPR improves post-resuscitation survival and neurological function in a rat model of CPR.

References

Disclosure
None