8 Abstracts

26 EFFECTS OF HYPERTONIC SOLUTIONS ON ACID-BASE BALANCE (ABB) DURING SIMULATED PREHOSPITAL RESUSCITATION OF HEMORRHAGIC SHOCK. T.M. Owen*, W.C. Watson*, D.S. Prough*, C.G. Kramer. Dept. of Anesthesiology, UTMB, Galveston, TX 77555.

Acidemia of traumatic shock can impair cardiovascular function. Lactated Ringers (LR) corrects volume deficits but not ABB. Hypertonic saline dextran (HSD), 7.5% NaCl 6% Dextran-70, can cause hyperchloremic acidemia. Hypertonic saline dextran (HAD), 7.9% Na-acetate 1.9% NaCl 6% Dextran-70, reportedly improves cardiovascular function and buffering capacity. We compared the effects of simulated prehospital resuscitation on ABB in anesthetized swine, severely hemorrhaged by 35% blood volume plus a 5 mm aortotomy. Animals were subjected to a "prehospital regimen" of HAD, HSD or LR, infused until 60% of baseline cardiac output (CO) was achieved, or a maximum of 10 mL/kg was used. The aortotomy was surgically corrected and resuscitation continued, using only LR to maintain mean arterial pressure (MAP) at 80% baseline. During resuscitation target CO was achieved with less HAD solution (2.4±0.4 mL/kg) than HSD (4.5±1.1 mL/kg) or LR (9.4±0.6 mL/kg). Base excess (BE) significantly increased in the HAD group, while HSD and LR initially decreased. Changes in pH and HCO3 corresponded with those of BE. Serum lactates increased to 10–13 mmol/L during shock from a baseline of 2–4 mmol/L, and only partially recovered to 7–11 mmol/L with no significant difference between groups. HAD provided superior ABB and cardiovascular efficiency compared to HSD and LR during resuscitation of severe hemorrhagic shock.


Phenytoin attenuates PMN-mediated acute lung injury (Flick Crit Care Med 1993; 21). We studied the effect of phenytoin on injury after smoke inhalation since this damage is mediated by PMNs. Method: Chronically instrumented sheep (n=18) were divided into three groups: Five sheep (SD group) were given phenytoin (12.5 mg/kg) 30 min after inhaled smoke. Two groups were given smoke only (n=8: SO group) or phenytoin only (n=5:DO group). The sheep were studied for 24h, post injury. Result: Lung lymph flow increased in SO and SD groups. There was no significant change in mean arterial pressure (86 ± 2 vs 88 ± 2 mmHg at baseline, 86 ± 7 vs 86 ± 2 mmHg at 24 h, SO vs SD group) and cardiac index (6.7 ± 0.4 vs 5.6 ± 0.4 L/min/m² at baseline, 5.0 ± 0.3 vs 4.9 ± 0.8 L/min/m² at 24 h.). Emax, an index of myocardial contractility fell in the SO group but not in SD group (62 ± 1% of baseline vs 103 ± 2% of baseline at 24 h).

28 EARLY, LOW-VOLUME HYPERTONIC SALT-DEXTRAN RESUSCITATION FOR THERMAL INJURY. AE Messavage* and RA Gunther. Univ Calif Davis Burn Center, Sacramento, CA 95817.

Hypertonic saline-dextran (HSD) has been proposed for low volume resuscitation from hemorrhage in the prehospital setting when IV access may be difficult. Patients with large burns also have problems with IV access, and hypotension. We compared a burn resuscitation using HSD vs NS for the first hour.

16 chronically instrumented sheep were subjected to a 33% scald burn under anesthesia after a 1 hr baseline determination. All animals were conscious within 30-40 min after burn injury, and given pm analgesics after recovery. After no resuscitation for 1 hr to allow development of burn shock, 400 g/kg of NS or HSD (6% NaCl/5% dextran 70) was infused blindly over 1 hr. Resuscitation was continued with RL, titrated to maintain cardiac output (CO) within 10% of baseline. Cardiovascular parameters were measured hourly for 12 hrs and then every 4 hrs. At 24 hrs the animals were sacrificed and tissue samples obtained for water content.

<table>
<thead>
<tr>
<th>CO input (cc/kg/burn)</th>
<th>Na+ (max)</th>
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<tr>
<td>(2hrs)</td>
<td></td>
</tr>
<tr>
<td>0-8 hrs</td>
<td>157 ± 4.0</td>
</tr>
<tr>
<td>0-24 hrs</td>
<td>159 ± 4.0</td>
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* p<0.05

HSD infusion produced improved CO compared to NS, and fluid requirements were significantly decreased for the 1st 8 hrs. Serum Na+ was elevated with HSD but normalized during the experiment; hypernatremia was not a problem. Tissue water content at 24 hrs was equivalent. Early HSD resuscitation rapidly stabilizes the thermally injured patient.


Right ventricular (RV) failure during resuscitation from severe hemorrhagic shock (SHS) may contribute to the high mortality during this period. We used extracorporeal-assisted circulatory support (EACS) during the resuscitation phase (RES) of a RS model, testing the effect of this support using pressure-volume analysis. After 3 hours of RS (MAP=35mmHg), animals were resuscitated using either shed blood and colloid (CONTROL, n=12) and observed for an additional 180 minutes, or placed on femoral-femoral bypass maintaining a MAP > 70mmHg (EACS, n=12). After 120 minutes, animals were weaned from EACS and observed for an additional 60 minutes. Data at baseline were similar between the 2 groups. Survival was superior in the group resuscitated with EACS (77% vs 105 hrs vs 0.05). During the first hour after shock, RV pressures were significantly lower in the EACS group. By the final timepoint in the study, RV Stroke Work was markedly