

Normal saline resuscitation worsens lactic acidosis in experimental sepsis



CRISMA

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Introduction

- Infusing large volumes of 0.9% sodium chloride causes hyperchloremic acidosis.
- The clinical relevance of this hyperchloremic acidosis is uncertain.
- A recent trial¹ showed 0.9% sodium chloride/albumin in 0.9% sodium chloride increased mortality in malarial sepsis compared to no fluid.

Hypothesis

- 0.9% sodium chloride resuscitation increases acidosis and worsens hemodynamics in sepsis compared to balanced crystalloids.

Methods

- 50 adult male Sprague Dawley rats were subjected to cecal ligation and puncture (CLP).
- 18 hours later they were randomly allocated to receive 0.9% sodium chloride or Plasma-Lyte™.
- 30ml/kg of fluid resuscitation was delivered over 4 hours.
- Arterial blood gases were measured at baseline, 18 hours after CLP (before resuscitation), after resuscitation and 24 hours after resuscitation.
- Blood pressure and pulse rate were measured during resuscitation.

Conclusions

- Fluid resuscitation with 0.9% sodium chloride worsens lactic acidosis in experimental sepsis, when compared with a balanced crystalloid, despite no significant difference in heart rate and blood pressure.

Implications

- Alternative mechanisms may explain the lactate level difference between the two groups such as:-
 - Increased cell stress.
 - Impaired oxygen delivery.
- More studies are needed to confirm and further investigate this phenomenon.

Acknowledgements

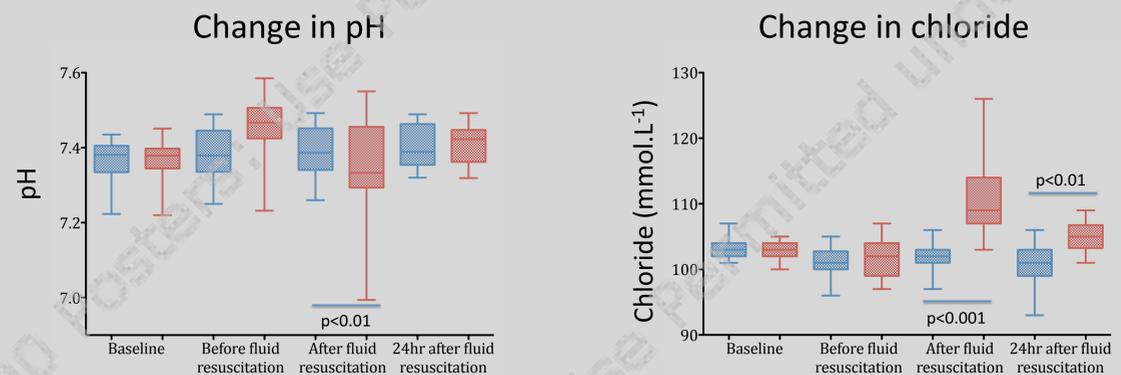
- Supported by a grant from Baxter, manufacturer of Plasma-Lyte™.
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References

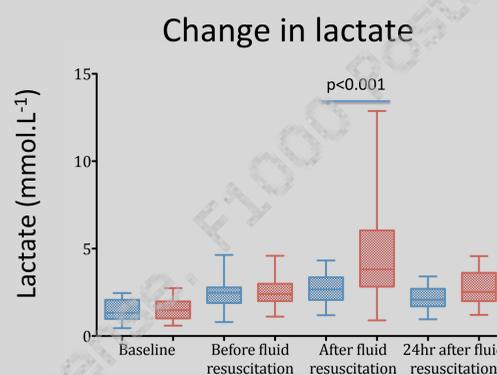
- Maitland K, et al *NEJM* 2011,364:2483-95.

Results

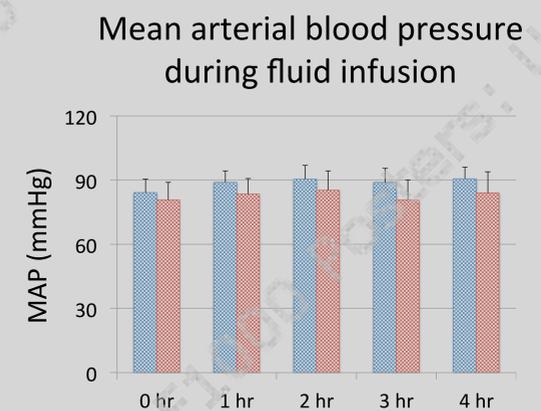
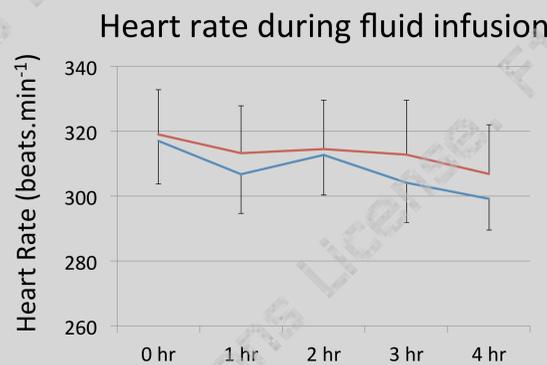
Legend Key:- = resuscitated with balanced crystalloid (Plasma-Lyte™) = resuscitated with 0.9% sodium chloride



Above graphs demonstrate that, as expected, serum pH and chloride were significantly higher after fluid resuscitation with 0.9% sodium chloride.



Adjacent graph shows significantly higher lactate levels in the 0.9% sodium chloride infusion group after fluid resuscitation, despite similar levels before resuscitation.



These 2 graphs show there was no significant difference in blood pressure or heart rate between the two groups during fluid infusion.

