

Federally mandated sepsis care guidelines have led to an increasing reliance on using serum lactate as a screen for sepsis and as a marker for the success of resuscitative efforts, despite confounders” Skaggs et al (2017).

Abstract:

Study Objectives: Federally mandated sepsis care guidelines have led to an increasing reliance on using serum lactate as a screen for sepsis and as a marker for the success of resuscitative efforts, despite confounders. Previous investigations have shown lactate levels to increase not only secondary to sepsis and other shock states but also secondary to exogenous substances such as metformin, propofol, and albuterol. Lactated Ringer's solution (LR) is a crystalloid containing 28 mmol/L of sodium lactate that is widely used in the resuscitation of septic patients. This study sought to isolate the effect of the administration of LR on serum lactate. Normal saline (NS) was used as a comparator.

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Methods: In this randomized, double-blind, placebo-controlled trial, thirty healthy adult volunteers were assigned to receive either 30 ml/kg of intravenous Lactated Ringer's solution or normal saline solution. Serum lactate was measured prior to and after the administration of the fluid bolus. Measurements were made using I-STAT 1 analyzer. The primary outcome was comparing the degree of change in serum lactate levels between the Lactated Ringer's and normal saline groups. The secondary outcome measure was assessing for the development of hyperchloremic metabolic acidosis in the normal saline group.

Results: After a 30 ml/kg bolus of intravenous LR, the mean serum lactate increased by 0.93 mmol/L (95% CI 0.42 mmol/L to 1.44 mmol/L). However, there was also a small increase in the mean serum lactate in the NS group of 0.37 mmol/L (95% CI -0.26 mmol/L to 1.00 mmol/L), such that there was not a statistically significant difference in the change in lactate when comparing the LR group to the NS group ( $p=0.2$ ). The NS group had larger drops in pH and bicarbonate compared to the LR group. The NS group had greater increases in Na and Cl

compared to the LR group.

Conclusions: A bolus of 30 ml/kg of LR given to healthy individuals results in an increase in serum lactate levels. It is not certain if this finding is applicable to patients with sepsis. A bolus of 30ml/kg of NS results in a reduction in pH and an increase in Na and Cl, a significant secondary outcome consistent with trend toward hyperchloremic metabolic acidosis in the NS group.

### Full Text

Reference:

Skaggs, Z.D., Zitek, T., Rahbar, A., Patel, J. and Khan, M. (2017) 59 Does Intravenous Lactated Ringer's Solution Raise Serum Lactate? *Annals of Emergency Medicine*. 70(4), Supplement, p.S24.

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