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Article:

Michael A. Puskarich, Nathan I Shapiro, Michael Massey, Jeffrey Cline & Alan Jones. Lactate Clearance in Septic Shock is Not a Surrogate for Improved Microcirculatory Flow. Academic Emergency Medicine. June 2016, Vol 23, No. 6, pgs. 690-693.

Introduction:

Elevated lactate has been shown to be associated with adverse effects in sepsis and has been used as a measure of hypoperfusion to tissues. Stabilization of lactate levels is associated with decrease in morbidity and mortality and has been used to measure resuscitation. However, many patients that have been resuscitated continue to have high levels of lactate. This study wanted to test the hypothesis that persistent low flow states to tissues are associated with non-clearance of lactate.

Methods:

This study was a secondary aim of a randomized control trial to determine the safety and efficacy of L-carnitine for the treatment of sepsis. Lactate & microcirculatory blood flow (side-stream dark-field video microscopy) were measured at enrollment into the study and then again at 12 hours. In addition, Sequential Organ Failure Assessment (SOFA) scores were measured at the beginning and then again 24 hours later. Inclusion criteria included SOFA > 5, cumulative vasopressor index >3, and recognition of sepsis within 16 hours. Primary outcome was measured as change in microcirculatory flow index and lactate clearance.

Results:

There were a total of 31 patients enrolled in the study, 23 were analyzed (others excluded due to poor microcirculatory studies). Median age 65, majority men, all received vasopressors, mean IVF volume was 4L. There was no significant difference found between lactate clearance and change in microcirculatory flow index.

Discussion:

This study looked at the associated between lactate clearance and microcirculatory blood flow to determine if lactate clearance could be used as a marker to measure change in blood flow. There was no significant link between the two measurements. Elevated lactate levels are unlikely to be solely related to poor tissue perfusion. However, lactate is being used to measure improved blood flow and in fact, the Surviving Sepsis Campaign recommends targeting lactate normalization. This study sheds light on the need for further investigation to determine the source of lactate in sepsis.

Bottom line:

There was no observed association between lactate clearance and improvement in circulatory blood flow, therefore negating the trending of lactate to measure improvement in shock states.
