Lactic Acid Timing and Survival in Sepsis

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Background

Measuring lactic acid levels is a common practice when identifying and monitoring treatment efficacy in patients with sepsis. There is no consensus regarding when lactic acid should be measured and its impact on survival.

Methods

We performed a retrospective chart review including patients diagnosed with sepsis, severe sepsis or septic shock at single hospital from 2014-2015 who had lactic acid levels obtained within 24 hours of arrival. Charts were identified by international classification of disease, 9th edition (ICD9) codes and data were abstracted by trained research assistants. Patients who developed sepsis after admission or where a lactate was not ordered were excluded. Lactate timing was defined as the time from arrival to the emergency department until the test was ordered in the electronic medical record. Abstracted variables included patient demographics (age, gender, etc.), sepsis characteristics (source of infection, etc.), mortality, and time from arrival to lactic acid level results. Patients were divided into groups based on lactate measurement at time intervals of <60 minutes, 60-119 minutes, and ≥120 minutes. Survival point estimates with 95% confidence intervals (CI) for survival were compared across time points.

Results

Of the 874 patients identified by ICD-9 code, 590 met inclusion criteria. The most common sources of infection were pneumonia (n=164; 27.8%) and urinary tract infection (n=138; 23.4%). The mean age (standard deviation) was 68 (17.4) with 46.4% of patients presenting in septic shock (n=275). Overall survival (95% CI) for all
patients was 68.6% (64.7% to 72.4%). When examined by time intervals, mortality did not differ between groups; <60 minutes (63.3%; 54.1% to 71.9%), 60-119 minutes (71.4%; 65.6% to 76.7%), and ≥120 minutes (68.2%; 61.2% to 74.5%).

**Conclusion**

In this retrospective chart review, we did not identify any association between the timing of lactic acid ordering and survival in septic patients. While other aspects of resuscitation may be related to mortality (e.g. IV fluids and antibiotics) lactate timing may be less important and consequently may not be an appropriate marker for assessing resuscitation quality.

Figure 1. Point estimates of survival (95% confidence intervals) for lactate timing.