

Prognostic relevance of serum lactate kinetics in critically ill patients

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Abstract

Purpose: Changes of lactate concentration over time were reported to be associated with survival in septic patients. We aimed to evaluate delta-lactate (Δ Lac) 24 h after admission (Δ 24Lac) to an intensive care unit (ICU) in critically ill patients for short- and long-term prognostic relevance. **Methods:** In total, 26,285 lactate measurements of 2191 patients admitted to a German ICU were analyzed. Inclusion criterion was a lactate concentration at admission above 2.0 mmol/L. Maximum lactate concentrations of day 1 and day 2 were used to calculate Δ 24Lac. Follow-up of patients was performed retrospectively. Association of Δ 24Lac and both in-hospital and long-term mortality were investigated. An optimal cut-off was calculated by means of the Youden index. **Results:** Patients with lower Δ 24Lac were of similar age, but clinically sicker. As continuous variable, higher Δ 24Lac was associated with decreased in-hospital mortality (per 1% Δ 24Lac; HR 0.987 95%CI 0.985–0.990; $p < 0.001$). After correction for APACHE II scores, baseline lactate level and sex, Δ 24Lac remained associated with lower in-hospital and long-term survival. **Conclusions:** Lower Δ 24Lac was robustly associated with adverse outcome in critically ill patients, even after correction for confounders. Δ 24Lac might constitute an independent, easily available and important parameter for risk stratification in the critically ill.

Keywords

Critically ill, Lactate, Delta-lactate, ICU, Risk stratification, Risk score.