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CORRESPONDENCE

Prognostic relevance of serum lactate kinetics: a powerful predictor but not Chuck Norris in Intensive Care Medicine

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Dear Editor,

We appreciate the letter to the editor by Knapik et al. [1] regarding our recent publication in *Intensive Care Medicine* [2], which analyzed the prognostic value of lactate kinetics in critically ill patients.

Knapik et al. present data of 192 critically ill patients evidencing a lactate concentration above 2.0 mmol/L on admission day. They report considerably higher mortality (50%) compared to our large cohort consisting of 2191 patients (27%). Although absolute lactate concentrations did not differ between survivors and non-survivors, Knapik et al. could verify in their study cohort a significant difference in ICU-mortality when subdividing the collective into two groups according to our Δ24Lac cut-off of 19%. However, the area under the curve (AUC) of ROC analysis in Knapik's study was only 0.55, while our ROC analysis revealed an AUC of 0.70 (95% CI 0.68–0.73) and, therefore, sufficient discriminatory power of Δ24Lac as predictor of mortality as reported in our original paper [2]. Landmark analysis of our data showed that the long-term outcome in our cohort is determined in the early stage during the ICU period. The proportion of the patients in the two groups in our study cohort was as follows: 1303 patients with $\Delta 24\text{Lac} \leq 19\%$ and 888 patients with $\Delta 24\text{Lac} > 19\%$.

Regarding the term describing changes of serum lactate concentration over time, we had also used "lactate clearance" in our initial manuscript version as it is utilized in numerous studies. However, after valuable input of the reviewers, we have decided to replace it by "delta-lactate", which is more accurate for the following reason: as lactate kinetics are determined by production and elimination of lactate, a decrease in lactate concentration might be due to a decreased production or increased elimination by the liver and other organs. Therefore, a proper evaluation of the real "lactate clearance" would require a special technique with intravenous injection of radiolabeled lactate, as performed previously [3, 4]. Furthermore, in our opinion, the common sense of the noun "delta" is a change per se, not imperatively meaning an increase, but also a decrease of value.

Altogether, we agree with Knapik and colleagues that prognostic value of lactate kinetics in critically ill patients is a complex subject which needs to be approached with caution. Future studies comparing prognostic relevance of lactate concentrations and lactate kinetics in different cohorts and regions could be a worthwhile endeavor.

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Compliance with ethical standards

Conflicts of interest
The author(s) declare that they have no conflict of interest.

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