

#187 Taylor Conrad

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### **The Utility of Interval Likelihood Ratios of Lactate to Predict Mortality in COVID-19 Patients**

Background: Several cut-off values for lactate are used to direct resuscitation efforts in various diseases. This study investigated if interval likelihood ratios (ILR) for lactate could improve clinical significance as a predictor of in-hospital mortality of COVID-19 patients. Methods: Patients presenting with COVID-19 who received an initial venous lactate measurement and whose mortality could be determined were analyzed. Receiver Operator Characteristic (ROC) curves were created to calculate the Area Under the Curve (AUC) for lactate ability to predict death. ILR for lactate were calculated and Bayes' theorem was used to calculate the post-test probability of death at each lactate interval. Kaplan-Meier was used to analyze time to death for the intervals. Results: 445 patients were included with a mortality rate of 42.7%. Median time to disposition for survivors (5 days) was not statistically significant ( $p=0.33$ ) from deceased (5 days). Lactate differed significantly ( $p<0.001$ ) in the deceased 2.35 (1.6, 3.7) versus survivors 1.7 (1.3, 2.2). Lactate as a predictor of mortality analyzed by ROC analysis yielded ( $p<0.001$ ) and an AUC of 0.68 (95%CI, 0.63-0.73) with a cutoff of 2.35 mmol/L. By ROC curve analysis, sensitivity (43%) and specificity (70%) were maximized in the interval lactate between 2-4 mmol/L, but with only minor ILR (1.45) with a minimal increase in the post-test probability of mortality from 43% to 53%. ILR were less than 1.00 for lactates between 0-2 mmol/L. Post-test mortality only significantly increased for the two-interval lactate groups  $\geq 4$  mmol/L, (ILR  $\geq 3.45$  and 3.69) increasing from 43% to 72% and 73%, respectively. Time to death between only significantly decreased at lactate levels  $\geq 4$  mmol/L. Conclusion: Although the ROC curve analysis showed that lactate of 2.35 mmol/L was the best cut-off, interval lactate analysis showed only a lactate  $\geq 4.0$  mmol/L significantly impacted the post-test probability of death and time to death.

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