Lactate in Critically Ill Patients an Outcome Marker with Time

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Abstract : Introduction: Static derangements in lactate homeostasis during ICU stay have become established as a clinically useful marker of increased risk of hospital and ICU mortality. Lactate indices or kinetic alteration of the anaerobic metabolism make it a potential parameter to evaluate disease severity and intervention adequacy. This is an inexpensive and simple clinical parameter that can be obtained by a minimally invasive means. Aim of work: Comparing the predictive value of dynamic indices of hyperlactatemia in the first twenty four hours of intensive care unit (ICU) admission with other static values are more commonly used. Patients and Methods: This study included 40 critically ill patients above 18 years old of both sexes with Hyperlactamia ($\geq$ 2 m mol/L). Patients were divided into septic group (n=20) and low oxygen transport group (n=20), which include all causes of low-O2. Six lactate indices specifically relating to the first 24 hours of ICU admission were considered, three static indices and three dynamic indices. Results: There were no statistically significant differences among the two groups regarding age, most of the laboratory results including ABG and the need for mechanical ventilation. Admission lactate was significantly higher in low-oxygen transport group than the septic group [37.5±11.4 versus 30.6±7.8 P-value 0.034]. Maximum lactate was significantly higher in low-oxygen transport group than the septic group P-value (0.044). On the other hand absolute lactate (mg) was higher in septic group P-value (< 0.001). Percentage change of lactate was higher in the septic group (47.8±11.3) than the low-oxygen transport group (26.1±12.6) with highly significant P-value (< 0.001). Lastly, time weighted lactate was higher in the low-oxygen transport group (1.72±0.81) than the septic group (1.05±0.8) with significant P-value (0.012). There were statistically significant differences regarding lactate indices in survivors and non survivors, whether in septic or low-oxygen transport group. Conclusion: In critically ill patients, time weighted lactate and percent in lactate change in the first 24 hours can be an independent predictive factor in ICU mortality. Also, a rising compared to a falling blood lactate concentration over the first 24 hours can be associated with significant increase in the risk of mortality.

Keywords : critically ill patients, lactate indices, mortality in intensive care, anaerobic metabolism

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