The Effect of Combined Target Therapy versus Lactate-guided Therapy on 30-day Mortality Rate of Septic Shock Patients: A Randomized Controlled Trial

Aphichat Suwanchanratsamee1, Virissorn Wongsrichanalai2

1Department of Medicine, Phramongkutklao Hospital, Bangkok 10400, Thailand, 2Division of Pulmonary and Critical Care Medicine, Department of Medicine, Phramongkutklao Hospital, Bangkok 10400, Thailand

Background: Early goal-directed therapy (EGDT) for severe sepsis patients published in 2001 showed the benefit in the reduction of mortality rate compared with conventional therapy. It has been hailed as a major breakthrough in surviving sepsis campaign and becomes a standard of care. Almost 15 years later, 3 independent multicenter randomized controlled trials (ProCESS, ARISE, and ProMISe) evaluated EGDT in severe sepsis and septic shock. All of them confirmed that there is no survival benefit of EGDT compared with the usual resuscitation care. Furthermore, EGDT seems not to be based on sepsis physiology because the definition of sepsis has now been updated. Serum lactate, a marker of microcirculation failure has become a prognostic value of septic shock patients. Normalization of lactate as a goal during sepsis resuscitation might have a benefit in the mortality rate reduction.

Objective: This study aimed to compare the 30-day mortality rate of septic shock patients between two groups using either combined target therapy (both EGDT and normalization of lactate) or lactate-guide therapy as a goal of resuscitation.

Methods: We conducted an open labelled non-inferiority RCT in a single center involving 164 patients aged > 18 years who had septic shock documented by Sepsis-3 criteria and admitted in medical intensive care unit, without meeting any exclusion criteria. Patients were randomized into 2 groups to receive either combined target therapy (N=83) or lactate-guided therapy (N=81) as a goal of resuscitation in the first 24-hour protocol of care. Primary outcome was to compare 30-day mortality rates between these 2 groups. Secondary outcomes were to compare the hospital and ICU length of stay, duration of mechanical ventilator use, and duration of vasopressor use.

Results: Preliminary results showed that there were no statistically significant differences between 30-day mortality rates of septic shock patients receiving combined target therapy (N=35, 42.17%) and lactate-guided therapy (N=38, 46.91%) (p = 0.541) groups, as well as the hospital length of stay, ICU length of stay, and the duration of mechanical ventilator use. While, the duration of vasopressor use and the number of patients receiving central venous catheterization tended to be lower in the lactate-guided therapy group.

Conclusion: The results of this small non-inferiority RCT demonstrate the benefit of using lactate normalization as a goal of septic shock resuscitation in terms of the reduction in unnecessary central venous catheterizations and the duration of vasopressor use. There is no significant difference in overall 30-day mortality rate between these two groups of patients.

Keywords: Sepsis, Septic shock, Mortality rate, Early goal-directed therapy (EGDT), Lactate