Effect of Dynamic Parameter-guided versus Central Venous Pressure-guided Fluid Resuscitation on Mortality in Patients with Sepsis and/or Septic Shock in Thammasat University Hospital

Pannarat Saisirivechakun1 Thiti Sricharoenchai1

1Department of Internal Medicine, Thammasat University, Pathumthani, 12120, Thailand

Background: Intravenous (IV) fluid resuscitation is the mainstay treatment in early goal-directed therapy (EGDT) for sepsis, which measures static central venous pressure (CVP) in first 6 hours. Several studies showed that noninvasive dynamic indices are more accurate than static indices for prediction of fluid responsiveness, however, there is no landmark study comparing the clinical outcomes of patients with sepsis between static and dynamic hemodynamic parameters.

Objective: The primary objective was to compare 30-day mortality risk between septic patients monitored by IVC measurement vs CVP, while the secondary objectives were to compare the proportion of patients achieving ≥1 macrovascular targets, ≥1 microvascular targets of EGDT in first 6 hrs, duration of shock, amount of fluid resuscitation in 72 hrs, and cumulative dose of NE.

Methods: A Single-blinded randomized controlled trial was conducted in Thammasat University Hospital between August 2016 and October 2017. The patients were enrolled and randomized to either experimental (IVC measurement) or control group (CVP measurement) stratified by APACHE-II (<25, or ≥ 25). We assessed and noted hemodynamics at baseline, during resuscitation, and till the first 6 hours, including the vital status at 30 days and data for secondary objectives. For patients who were not fluid responsive and were still unstable hemodynamics, we proceeded treatment according to SSC 2016.

Results: A total of 49 patients were enrolled. 25 received IVC measurement and 24 received CVP measurement. Mean age was 68.74 +/- 17.50 (69.65 +/-16.92 vs. 67.75 +/- 18.42; p=0.705) years and baseline characteristics was not different. The overall 30-day mortality was 32.65% (26.92% vs 39.13%; p=0.363) and 95.65% of patients with ≥1 macrovascular targets (95.65% vs 95.65%; p=1.000), while 85.42% of patients got ≥1 microvascular targets (92.00% vs 78.26%; p=0.237). Total iv fluid in 72 hours was 8718.76 +/- 2988.34 mL for all patients (8679.87 +/- 2856.45 vs 8757.65 +/- 3178.66; p=0.931). Cumulative vasopressor was 7.37 (2.45-18) mg for all patients (5.81 (0-10.25) vs 14.56 (5.63-45.07); p=0.009). Duration of shock was 26.5 (12-45) hours for all patients. (19(0-32) vs 39(21-57); p=0.004).

Conclusion: Non-invasive dynamic indices do not reduce the mortality, but the duration of shock in patients with sepsis.

Keywords: Inferior vena cava, Central venous pressure, Fluid resuscitation, Mortality, Sepsis, septic shock