

Abstract

Introduction: Central venous oxygen saturation (ScvO₂) provides an estimate of body oxygen consumption/delivery ratio. It has been widely used for optimization of therapy in septic patients; however its value in severe heart failure / cardiogenic shock has not yet been established.

Objectives: We aimed to evaluate ScvO₂ as a prognostic indicator and as a diagnostic tool to guide therapy in patients with severe heart failure/cardiogenic shock.

Methods: ScvO₂ was prospectively assessed in 40 consecutive patients (mean age 56 ± 12 years, 24 female; left ventricular ejection fraction $36.53 \pm 7.79\%$) admitted with acute heart failure/cardiogenic shock requiring inotropic support \pm vasopressors. ScvO₂, lactate and oxygen extraction were compared in survivors and non-survivors, on admission, after 24 hours of therapy and before discharge/death.

Results: Out of 40 included patients, mortality occurred in 17 (42.5%) patients. Admission ScvO₂ did not differ between survivors & non-survivors (51.99 ± 7.05 vs. 47.51 ± 7.06 respectively), but lactate was significantly lower in survivors (2.75 ± 0.39 vs. 4.45 ± 2.58 ; $p=0.01$). After 24 hours of therapy, ScvO₂ increased in survivors vs. non-survivors (73.55 ± 3.07 vs. 56.55 ± 5.49 ; $p<0.0001$). Finally before discharge/death, ScvO₂ was significantly higher in survivors than non-survivors (70.2 ± 2.61 vs. 52.8 ± 6.09 ; $p<0.0001$). There was a significant positive correlation between ScvO₂ and ejection fraction. Multivariate analysis showed that ScvO₂ at 24 hours was an independent predictor of mortality as well as lactate. Using ROC curve, a cut-off value for ScvO₂ of 66% after 24 hrs of therapy was predictive of mortality (sensitivity 100% and specificity 100% $p=0.0001$).

Conclusion: In patients admitted with severe heart failure/cardiogenic shock requiring inotropic support \pm vasopressors, ScvO₂ less than 66% despite optimal treatment is a marker of poor outcome and might be an indicator for considering more aggressive therapy.

Keywords: Acute heart failure; Cardiogenic shock; Central venous oxygen saturation.