Sepsis is responsible for significant morbidity and mortality in the United States, and early recognition and treatment of septic patients is essential for improving outcomes. Lactic Acidosis has been shown to predict disease severity and mortality in ED patients with infection. Recently, exhaled end-tidal carbon dioxide concentration (ETCO2) was demonstrated to correlate with clinical measures of organ failure and lactate levels in febrile ED patients.

This study assessed whether levels of ETCO2 were associated with in-hospital mortality and examined the correlation between ETCO2 and serum lactate levels in patients presenting to the ED with suspected sepsis.

We enrolled 201 patients over 22 months with a mean age of 65 years. 53% were male, 36% were admitted to the ICU, 24% were put on vasopressors, 31% were blood culture positive, and 18% were intubated. The mean length of stay was 8.6 days (range 1-54) and in-hospital mortality was 14%. Overall mean levels of lactate and ETCO2 in all patients were 3.1mMol/L and 32 mmHg respectively. Mean ETCO2 in patients who survived to discharge was 33 and in patients who did not survive it was 26 (P=0.001). Mean levels of lactate in patients who survived to hospital discharge was 2.6 and in non-survivors the mean was 6.1 (P<0.001). There was a significant inverse relationship between ETCO2 and lactate levels with a correlation coefficient of -0.507 (P=0.001), so as lactate levels increased ETCO2 levels decreased. This significant correlation existed regardless of whether lactate was measured via venous (correlation coefficient of -0.493; P<0.001), or arterial (correlation coefficient of -0.526; P<0.001) sampling.

There was a significant association between levels of ETCO2 and in-hospital mortality in emergency department patients with suspected sepsis. Additionally, ETCO2 levels were significantly and inversely correlated with lactate levels in these patients. Future studies are needed to assess whether use of ETCO2 levels in clinical evaluation can decrease time to diagnosis and improve outcomes.

**References**