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Correlation between Central Venous Oxygen Saturation (ScvO₂) and Serum Lactate in Resuscitation of Severe Abdominal Sepsis Using Early Goal Directed Therapy Protocol

Ratin Adira, Kiki Lukman, Doddy Tavianto

Abstract

Introduction. Intraabdominal infection with severe sepsis is followed with high mortality. Sepsis leads to imbalance of systemic oxygen delivery and oxygen demand, resulting in global tissue hypoxia and anaerobic metabolism. A more definitive resuscitation strategy applies early goal directed therapy (EGDT) to achieve a balance between systemic oxygen delivery and oxygen demand within 6 hours. Central venous oxygen saturation has been shown to be a surrogate for the cardiac index as a target for hemodynamic therapy. Serum lactate is considered to be the end product of anaerobic metabolism. There's question whether arterial lactate can be alternative measure to replace ScvO₂. The purpose of a study is to find out the correlation between ScvO₂ and serum lactate in severe septic patient due to intraabdominal infection.

Method. A study was run with cohort prospective quasi experimental, ScvO₂ and serum lactate were measured every two hours in EGDT period. The results were correlated with Pearson's Correlation.

Results. There were 35 severe septic patients due to intraabdominal infection. Sixty three percents were male, majority ranged of 51–60 years old, 57% admissions to hospital after had 1–3 days abdominal pain. Fourty six percents of the patients were due to peptic ulcer perforation. Mortality rate was 43%. Mean of serum lactate level were decreased from 3.95 to 3.05 in 6 hours resuscitation. Otherwise, mean of ScvO₂ were found increased from 65.1% to 77.75% in 6 hours. Pearson's correlation between ScvO₂ and serum lactate is 0.218.

Conclusion. There was a weak correlation between ScvO₂ and serum lactate in severe sepsis due to intraabdominal infection that achieved EGDT resuscitation. Serum lactate cannot replace ScvO₂. Indonesia J Surg 2015 ;44 : 14 – 7

Keywords: severe sepsis, intraabdominal infection, EGDT, ScvO₂, serum lactate

Introduction

Intraabdominal infection is a common entity encountered in daily clinical practice, leading to severe sepsis. And when intraabdominal infection is associated with severe sepsis, such a condition referred to the leading cause of death in surgical practice.^{1,2,3}

Circulating intravascular volume in sepsis is abnormally diminished in addition to peripheral vasodilatation, myocardial depression and hypermetabolic stage lead to altered homeostasis

with the imbalance of systemic oxygen delivery and oxygen demands. And in turn, leading to global tissue hypoxia i.e. shock. Early goal directed therapy (EGDT) is somehow referred to the protocol of fluid resuscitation in patients with severe sepsis and septic shock, which is applied in the first 6 hours following instituted diagnosis. EGDT is designed to treat cardiac preload, after load, as well as vascular contractility to achieve normal homeostasis i.e. the balanced systemic oxygen delivery and oxygen demand. Such a homeostasis is achieved through strategic fluid resuscitation with monitored mixed venous oxygen saturation and serum lactate return to normal.¹ Clinical application of EGDT protocol as well as surviving sepsis campaign guidelines have shown the evidence followed by better survival rate and also reduce mortality rate below of 30%.^{1,2,3,4}

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