

Lactate Clearance VS Central Venous Oxygen Saturation as Goals of Early Sepsis Therapy

JAMA (Feb. 2010)

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2010/ 03/ 17 ; Wed

背景

- 嚴重感染住院率 -- 越來越高
- 大都數最初在ED(emergency department)治療
- ED的 targeted therapy → 可降低死亡率
- 目前 建議 用Central venous oxygen saturation ($S_{cv}O_2$)來評估 Tissue oxygen delivery → 臨床上有些困難
- Lactate clearance -- 較容易

研究目的

- 證實用Lactate clearance來評估 嚴重感染及休克的 治療目標 並沒有比 用 $S_{cv}O_2$ 評估來的差

研究方法

- 隨機臨床試驗
(Prospective Randomized Clinical Trial)
- 美國的 3家 醫療中心
- Jan 2007 to Jan 2009
- 到ED的 所有嚴重感染患者中 300位
- 兩組:Lactate clearance & $S_{cv}O_2$
- 進行直到達到目標 或 至六小時

結果

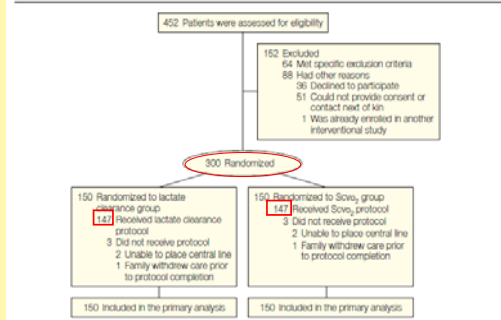
- Primary endpoint : absolute in-hospital mortality
- 預定死亡差別 = -10%
- $S_{cv}O_2$ 組 : 23% 死亡
- Lactate clearance 組 : 17% 死亡

結論

1. 兩組的 絕對住院死亡率 沒有差別
(沒有達到預設的10%差異)
2. 兩組的 治療相關不良事件 沒有差別

討論

Figure. Study Flow Diagram



$$Cl_{\text{Lactate}} = \frac{[\text{lactate}_{\text{initial}} - \text{lactate}_{\text{delayed}}]}{\text{lactate}_{\text{initial}}} \times 100\%$$

S_{cvO_2} by computerized spectrophotometer

Lactate clearance組

S_{cvO_2} 組

CVP $\geq$ 8mmHg
(Bolus isotonic crystalloid)
MAP $\geq$ 65mmHg
(Vasopressor drip)
 $Cl_{\text{Lactate}} \geq 10\%$
(Hct $<$ 30% $\rightarrow$ PRBC
Hct $\geq$ 30% $\rightarrow$ Dobutamine)

CVP $\geq$ 8mmHg
(Bolus isotonic crystalloid)
MAP $\geq$ 65mmHg
(Vasopressor drip)
 $S_{\text{cvO}_2} \geq 70\%$
(Hct $<$ 30% $\rightarrow$ PRBC
Hct $\geq$ 30% $\rightarrow$ Dobutamine)

All other treatments are kept the same.

Table 5. Hospital Mortality and Length of Stay

Variable	Lactate Clearance Group (n = 150)	S_{cvO_2} Group (n = 150)	Proportion Difference (95% Confidence Interval)	P Value ^b
In-hospital mortality, No. (%) ^a				
Intent to treat	29 (17)	34 (23)	6 (-3 to 15)	
Per protocol	25 (17)	33 (22)	5 (-3 to 14)	
Length of stay, mean (SD), d				
ICU	5.9 (8.46)	5.6 (7.39)		.75
Hospital	11.4 (10.89)	12.1 (11.68)		.60
Hospital complications				
Ventilator-free days, mean (SD)	9.3 (10.31)	9.9 (11.09)		.67
Multiple organ failure, No. (%)	37 (25)	33 (22)		.68
Care withdrawn, No. (%)	14 (9)	23 (15)		.15

Abbreviations: ICU, intensive care unit; S_{cvO_2} , central venous oxygen saturation.
^aPrimary study end point.
^bContinuous data are compared using an unpaired *t* test; categorical variables, using the χ^2 test.

• 休克 $\rightarrow$ 組織血氧供應不足 $\rightarrow$ 粒線體缺氧 $\rightarrow$ anaerobic glycolysis $\rightarrow$ $\uparrow$ [lactate]

- Lactate clearance 或 S_{cvO_2} 來評估 severe sepsis 的治療目標 – 沒有太大的差別
- 可用 Lactate clearance 代替 S_{cvO_2} 來評估 Tissue oxygen delivery

謝謝聆聽