

Rescue treatment with sustained low-efficiency daily diafiltration (SLEDD-f) for critically ill patients with profound shock and metabolic acidosis which was refractory to high dose continuous renal replacement therapy (CRRT)

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Background:

- Traditionally, continuous renal replacement therapies (CRRT) of high-volume range (>35ml/kg/hr) were applied for profound shock and refractory metabolic acidosis with limited efficacy.
- Sustained low-efficient hemodiafiltration (SLEDD-f) is a newly developed modality of critical renal therapy with balanced stability and efficacy.
- The purpose of the present study is to report the effect of SLEDD-f on those who were in shock status and experiencing refractory metabolic acidosis despite of high-volume CRRT treatment.

Method:

- From May, 2009 to Dec 2011, 9 consecutive cases of shock and renal failure who received high-volume CRRT for more than 12 hours but still had refractory acidosis (defined as arterial blood gas PH<7.2 or HCO₃⁻<14 mmol/l) were enrolled to receive SLEDD-f as rescue treatment.
- Clinical parameters and patient outcomes were recorded. Those with post-treatment arterial blood PH>7.3 along with HCO₃⁻ increase >6 mmol/l were defined as responders.

Results:

- Five patients were responders and four were non-responders. (**Table 1**)
- The 30-day mortality rate was 60% in responders and 100% in non-responders. The survival time after initiation of rescue treatment was 325.6±362.0 hours in responders and 28.25±31.94 hours in non-responders.
- Pre-SLEDD-f inotropic equivalent was 58.88 ± 40.91 in responders and 31.54 ± 18.74 in non-responders.
- Intra-dialytic hypotension developed in one (20%) of responders and three (75%) of non-responders.

Table 1. Comparison between the non-responder and responder groups

	Responders	Non-responders
Gender (M:F)	0: 5	3:1
Age(years)	65.40±11.19	62.25±16.88
ESRD (Y:N)	2:3	2:2
APACHE score	130±26.63	128.11±30.06
SOFA score	14.2±2.58	16.75±2.99
Pre-SLEDDF IE (mcg/kg/min)	58.88 ± 40.91	31.54 ± 18.74
Pre-SLEDDF oxygenation (PaO₂/FiO₂)	438.76 ± 110.95	209.36 ± 119.31*
Pre-SLEDDF compliance (ml/cmH₂O)	27.14±4.19	16.98± 7.62*
Pre-SLEDDF BT (Celsius degree)	32.68±3.68	35.85±1.27
Δ Body temperature (Celsius degree)	3.04±2.63	0.5±1.11
Pre-SLEDDF HCO₃⁻ (mEq/L)	8.52±4.17	13.18±1.59
Δ HCO₃⁻ (mEq/L)	10.4±2.67	6.7±2.89
Intradialytic hypotension	1	3
Survival time (hour)	325.6±362.02	28.25±31.94
Mortality	3 (60%)	4 (100%)

* represent the significance between the responders and non-responders

Conclusion:

- SLEDD-f could at least temporarily correct metabolic acidosis even in exceptionally critical condition.
- Those with better pulmonary conditions before SLEDD-f, i.e. better oxygenation status and better lung compliance, were more likely to be responders.
- Further study about early aggressive treatment of metabolic acidosis with SLEDD-f is required to weigh clinical value of SLEDD-f in such clinical condition with extremely high mortality.