

HYPOTHERMIC NEUROPROTECTION AFTER CARDIAC ARREST – THE USE OF SERUM-SPECIFIC ENOLASE AND S-100 β TO PREDICT OUTCOME

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Purpose of the study

To investigate the prognostic value of serum levels and time course of neuron-specific enolase (NSE) and S-100 β protein in comatose cardiac arrest survivors treated with hypothermia.

Materials and Methods

Sixty comatose cardiac arrest patients with return of spontaneous circulation (ROSC) were treated with induced hypothermia, 33 \pm 1 $^{\circ}$ C for 24h. Hypothermia was induced with cold saline and maintained with a waterfilled wrapping system (Thermowrap $^{\circledR}$). NSE and S-100 β protein were prospectively sampled and analyzed at 2h, 24h, 48h and 72h after cardiac arrest and compared with neurological outcome (cerebral performance category, CPC) at hospital discharge.

Results

Data from the first 30 patients show that early serum levels (2h) of NSE are higher in patients with bad outcome (CPC 3-5) as compared to patients with good outcome (CPC 1-2) (18.5 \pm 5.6 μ g/L vs 13.7 \pm 6.5 μ g/L). Moreover, a continuous increase in NSE at 24h and 72h was seen in patients with bad outcome, whereas patients with good outcome had unchanged or decreasing serum levels. Early serum levels (2h) of S-100 β were significantly lower in patients with a good outcome (1.0 \pm 0.8 μ g/L) as compared to patients with a bad outcome (1.8 \pm 2.8 μ g/L). Serum levels of S-100 β decreased over time (24h, 48h, 72h) in both patient groups (good and bad outcome) but remained higher in patients with a bad outcome at all time points.

Conclusion

Early evaluation of S-100 β protein (2h) may be of a prognostic value in comatose cardiac arrest survivors treated with hypothermia, which is in accordance with data from non-cooled patients (1). Increasing levels of NSE at 24h and onwards seems to predict bad outcome, as shown in a recent study (2). The potential value of analysing NSE and S-100 β for predicting outcome is promising but needs further exploration.

References

1. Hachimi-Idrissi et al. Resuscitation. 2002 Jun;53(3):251-7
2. Tiainen et al. Stroke. 2003 Dec;34(12):2881-6

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