



The Severity of Hyperlactatemia as A Guide of Targeted Temperature Management (TTM) for Pediatric Asphyxial Out-of-Hospital Cardiac Arrest

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Introduction

72-hr therapeutic hypothermia (TH) (33°C) was thought to improve 1-month survival rate and 6-month neurological outcome of pediatric asphyxial out-of-hospital cardiac arrest (OHCA) patients in our previous study. The aim of this study was to investigate the benefit of 72-hr TH on the 6-month and 1-year survival rate and 6-month neurological outcome of pediatric asphyxial OHCA patients compared to normothermia (NT) (35-36 °C) based on initial lactate level.

Methodology

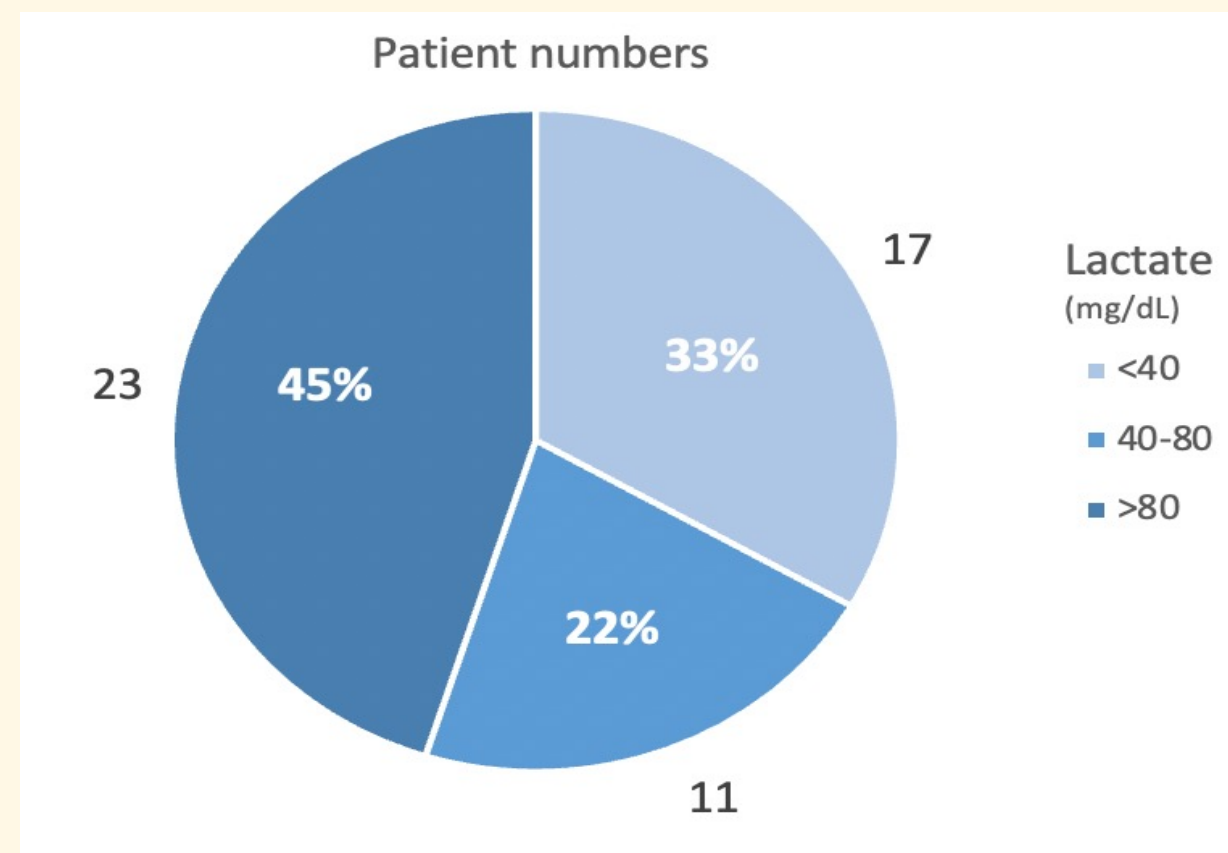
This is a retrospective cohort study conducted at tertiary intensive care unit between May 2010 and December 2021. All previously healthy children from 9-day-old to 18 years of age who had asphyxial OHCA, with a history of at least 3 min of chest compressions were included. The neurological outcome was evaluated with Pediatric Cerebral Performance Category (PCPC) scales.

Results

Patient characteristics:

Fifty-one patients met the eligibility criteria for the study. Thirty-seven (72%) were male, and the mean age was 4.77 ± 5.69 years.

Results



Patient numbers of TH and NT:

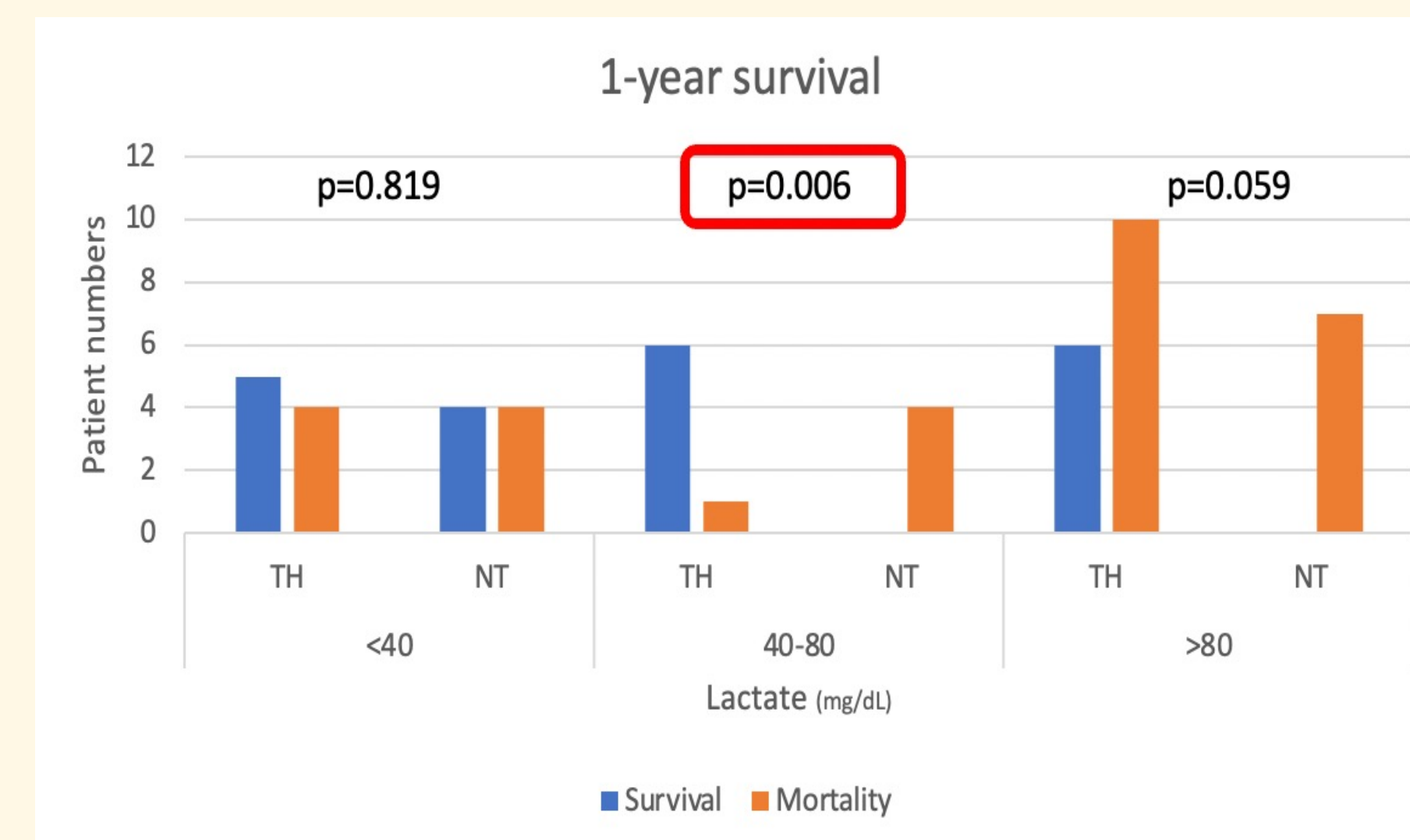
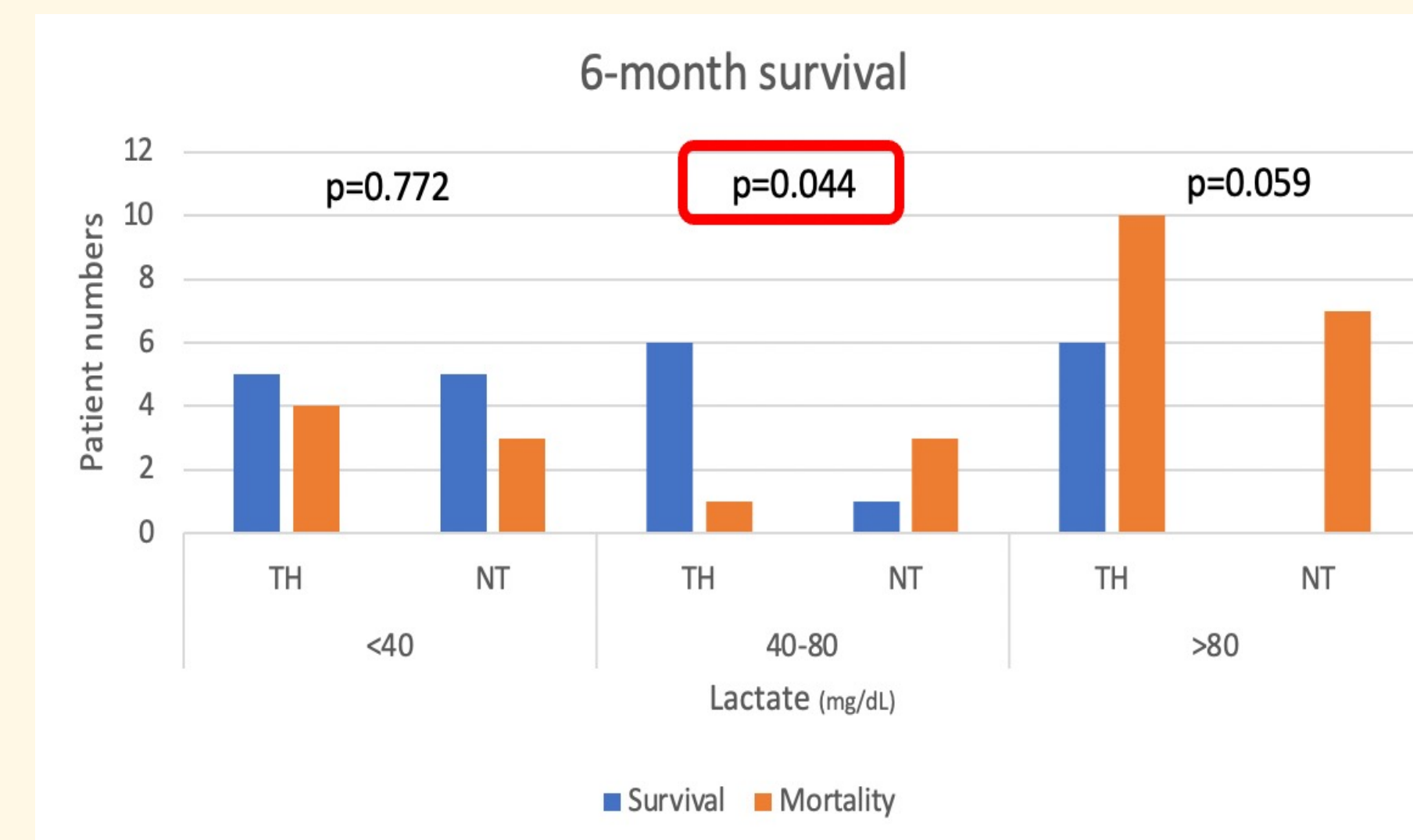
- Lactate <40 mg/dL : TH (9, 53%) ; NT (8, 47%)
- Lactate 40-80 mg/dL : TH (7, 64%) ; NT (4, 36%)
- Lactate >80 mg/dL : TH (16, 69%) ; NT (7, 31%)

The 6-month survival rate was significantly higher (p=0.044) after TH (6/7, 86%) than NT (1/4, 25%) in the group with lactate level between 40 and 80 mg/dL.

Furthermore, 1-year survival rate in this group was also significantly better (p=0.006) after TH (6/7, 86%) than NT (0/4, 0%).

There were no significant differences of 6-month and 1-year survival rate between TH and NT in the groups of lactate level <40 mg/dL and >80 mg/dL.

Improvement of 6-month neurological outcome (PCPC ≤2) was found after TH (3/7, 43%) than NT (0/4, 0%) in the group with lactate level between 40 and 80 mg/dL. However, it was not statically significant (p=0.104).



Conclusion

In this study, we established a guide of TTM for pediatric OHCA patients based on the severity of hyperlactatemia.

Pediatric asphyxial OHCA patients with initial lactate level between 40 and 80 mg/dL had significantly better 6-month and 1-year survival rate after TTM.

Although there was a trend of improved 6-month neurological outcome after TH than NT in the group with lactate level between 40 and 80 mg/dL, there was no statically significance.

References

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