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Letter to the Editor

Letter by Li et al. regarding article, “Optimal timing to measure optic nerve sheath diameter as a prognostic predictor in post-cardiac arrest patients treated with targeted temperature management”



To the Editor,

We read with great interest the recent article by Park et al,¹ “Optimal timing to measure optic nerve sheath diameter as a prognostic predictor in post-cardiac arrest patients treated with targeted temperature management.” However, we have some concerns in regard to their study conclusion. The authors recommend that performing optic nerve sheath diameter (ONSD) measurement using ultrasonography at 24 h after return of spontaneous circulation (ROSC), rather than immediately after ROSC, to predict neurologic outcome in post-cardiac arrest patients treated with target temperature management (TTM).

Early lots of studies have shown that reductions in core temperature during therapeutic hypothermia (TH) under 35 °C cause vasoconstriction and shivering, which lead to skin breakdown, infection and increased oxygen consumption.² To reduce the above observed complications, anesthetics and sedatives were administered during TH in adult patients after CA in intensive care unit.

ONSD is a noninvasive method and is sensitive and specific in detecting raised intracranial pressure (ICP).³ Under such therapeutic hypothermia (TH) under 35 °C, an important question is raised: ONSD may not reflect the patient’s true ICP with sedative and anesthetic intervention after CA.

ICP screened ONSD by could be inadvertently altered by sedatives and anesthetics, and not be the native representation of patient cerebrospinal fluid pressure during the interventional period of mild TH. In addition, it is still debatable on how to precisely titrate the depth of sedation during TH for patients after CA. Furthermore, the pharmacokinetics of sedative regimens may be altered under mild hypothermia and result in prolonged systemic clearances of anesthetic agents. There may be accumulative effects of sedatives for CA patients who have undergone TH, which leads to delay in awakening, extending the duration of mechanical ventilation and other subsequent complications.⁴ Mild TH plus the accumulative effect of sedatives could have a significant impact on the activity of brain function, one would suspect that the predictive value of ICP screened ONSD could be obscured.⁵

Therefore, when sedatives and anesthetics are applied for patients

during TH after CA, the ICP screened ONSD is not consistent and its predictive value becomes questionable.

From the discussion above, the current study by Park did not provide convincing evidence that the ICP screened ONSD has a reliable value to predict patient’s neurological prognosis with the influence of hypothermia and sedative agents. We suggest that further study is necessary to elucidate the relationship between the ICP screened ONSD and neurological outcome after CA.

Disclosures

None.

Conflict of interest

No conflict of interest exists in the submission of this manuscript, and manuscript is approved by all authors for publication.

REFERENCES

1. Park JS, You Y, Min JH, et al. Optimal timing to measure optic nerve sheath diameter as a prognostic predictor in post-cardiac arrest patients treated with targeted temperature management. *Resuscitation* 2019;30511–8 pii: S0300-9572.
2. Peberdy MA, Callaway CW, Neumar RW, et al. Part 9: post-cardiac arrest care: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation* 2010;122:S768–86.
3. Raffiz M, Abdullah JM. Optic nerve sheath diameter measurement: a means of detecting raised ICP in adult traumatic and non-traumatic neurosurgical patients? *Am J Emerg Med* 2017;35:150–3.

4. Empey PE, Miller TM, Philbrick AH, Melick JA, Kochanek PM, Poloyac SM. Mild hypothermia decreases fentanyl and midazolam steady-state clearance in a rat model of cardiac arrest. *Crit Care Med.* 2012;40:1221–8.
5. Weeke LC, Vilan A, Toet MC, van Haastert IC, de Vries LS, Groenendaal FA. Comparison of the thompson encephalopathy score and amplitude-integrated electroencephalography in infants with perinatal asphyxia and therapeutic hypothermia. *Neonatology* 2017;112:24–9.

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