

00083 **Novel Wearable Cooling Device for Early Initiation of Targeted Temperature Management in the Emergency Department: A Retrospective Cohort Study**

*Yap Leong Gen<sup>1</sup>, Sohil Pothiwala<sup>2</sup>, Kenneth Tan<sup>2</sup>, Aaron Wong<sup>3</sup>, Sewa Duu Wen<sup>2</sup>, Eric Lim<sup>3</sup>, Chin Chee Tang<sup>3</sup>, Marcus Ong<sup>2</sup>, Nur Shahidah<sup>2</sup>*

<sup>1</sup>National University of Singapore, <sup>2</sup>Singapore General Hospital, <sup>3</sup>National Heart Centre Singapore

**Aims:** Targeted temperature management (TTM) is an important component of post - cardiac arrest care. Although the optimum cooling method is not known, studies have suggested that prompt and quick cooling is associated with better outcomes. The aim of this study was to evaluate the cooling efficacy of a protocol including a novel cooling device in the Emergency Department (ED).

**Methodology:** This was a single - center pre - post cohort study of post - cardiac arrest patients with return of spontaneous circulation (ROSC), for whom TTM was initiated at a tertiary hospital between April 2010 and December 2017. A surface cooling device (CarbonCool, Global Healthcare Pte Ltd), which uses a graphite cooling material in an insulating suit, was introduced in July 2015. Control patients enrolled before the intervention period received icepacks in the ED and cold saline. For both periods, the target temperature was 34.00C, with TTM continued in the ICUs. The primary outcome was time from ROSC to target temperature (TT).

**Result:** Of 124 patients included, 40 were in the intervention period and 84 in the control period. Time from ROSC to TT was significantly lower in the intervention period at 119 (Interquartile range (IQR): 65 - 250) minutes versus 482 (IQR: 356 - 596) minutes ( $p < 0.001$ ). There was no statistical difference in survival to discharge (30.0% versus 32.1%,  $p = 0.839$ ) and Glasgow - Pittsburg Outcome scores (1 or 2 in 17.5% versus 21.4%,  $p = 0.811$ ). The intervention period also had a faster cooling rate (initiation of TTM to TT of 73 (IQR: 40 - 150) versus 142 (IQR: 75 - 262) minutes,  $p = 0.014$ ). There were no reported serious adverse events associated with the device.

**Conclusion:** Use of a novel cooling device in the ED resulted in a shorter time to target temperature. As it is reusable and does not require a power source, it has potential to be an affordable solution for pre - hospital and transport cooling.