Therapeutic hypothermia after return of spontaneous circulation: Should be offered to all?

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- Out-of-hospital cardiac arrest (OHCA) has an incidence of 52.1 per 100,000 population
 Only 1/2 of OHCA patients get to the baseital
 - Only 1/3 of OHCA patients get to the hospital with return of spontaneous circulation (ROSC)
 - 2/3 of these die before discharge from the hospital

• Post-cardiac arrest treatment aims to minimise brain injury

- Avoiding fever, hypotension and hyperglycemia may reduce brain injury
- Therapeutic hypothermia (32–34 °C) for 12– 24 h starting as early as possible but preferable within 6 h

Targeted temperature management

Hx:

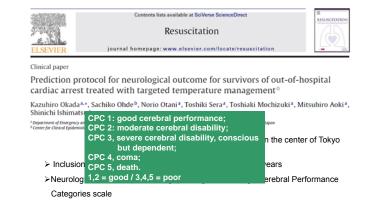
- ➤ Initially report 1940,1950
 - (Duration, temperature, indication were inconclusive)

>2002, two randomized study:

- Improved neurological outcome at hospital discharge,6 months later
- Using TTM (32–34 °C) initiated within minutes to hours after ROSC and maintained for 12-24 h.

What kind of patient will benefit from TTM

- Unreliable:
 - clinical signs (pupillary light, corneal and vestibulo-ocular reflexes)
 - biochemical markers (e.g., neuronal specific enolase, S100 protein)
 - test findings (somatosensory evoked potentials)
 - Imaging modalities



Predictors of good neurological outcome

- Arrest-to-first cardiopulmonary resuscitation attempt interval <5 min</p>
- Ventricular fibrillation or ventricular tachycardia in the first monitored rhythm
- Absence of re-arrest before leaving the emergency department
- Arrest to-return of spontaneous circulation interval ≤30 min
- Recovery of pupillary light reflex

5-R score(0-7分)

Initial Rhythm<1>, starting Resuscitation<2>, Return of spontaneous circulation<2>, light Reflex<1>, absence of Re-arrest<1>

- ➢ if 5 R score ≥5
 - sensitivity of 82.5%
 - specificity of 92.3%

Pitfall

406 OHCA pts

96 TTM

66 included

406人中只有96人使用TTM 消失的人數:少的310人未交代原因 需要prospective study

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16 extracorporeal life support

8 cessation due to unstable 3 GCS >8 at ED

- 1 different hypothermia protocol
- 2 transfer from other hospital

40/66 (60.6%) were discharged with good neurologic outcome (CPC1 or 2)

Conclusion

- ➤ A Canadian study,
- 99% of emergency and critical care physicians were aware of TTM but only 68% of them had used it in clinical practice"
- A simple and highly specific tool will provide emergency physician to predict potential benefic from TTM

Thank you

Further

- ➢Optimal techniques
- ≻Duration of cooling,
- Maximum delay in achieving target temperature
- > Optimal method to maintain cooling
- Preferred rate of rewarming