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Active Controlled Hypothermia During Neonatal Transport for Hypoxic-Ischemic Encephalopathy

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Otis (Westin Waterfront)

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Background: Whole-body hypothermia (WBH) (targeted core temperature range 33-34 °C) started before 6 hours of age has been shown to decrease mortality and the risk of permanent neurological impairment in neonates with hypoxic-ischemic encephalopathy (HIE). Preliminary data suggest that treatment efficacy might be increased with the immediate introduction of hypothermia following delivery.

Purpose: To study the safety and feasibility of the introduction of active hypothermia by the transport team upon arrival at the delivery room and during transport to a referral center of neonates with HIE.

Methods: Active controlled hypothermia was used in neonates with HIE by a dedicated neonatal emergency and transport service team. The cooling protocol utilized was based on the procedures described by the "TOBY" trial. Active WBH was initiated upon the transport team's arrival and continued during transport with Tecotherm TSmed 200 N. The time to reach therapeutic temperature range and the stability of vital signs and blood gases during hypothermia were prospectively studied. Data are shown as medians [interquartile range].

Results: Active WBH was used in 47 neonates with HIE (GA: 39 [38;40] weeks, BW: 3200 [3000;3510] g, Apgar score at 1 and 5 minutes were 2 [1;3], and 5 [3;6.7], respectively). Median age and core body temperature at the time of arrival of the transport team to the referring center were 0.77 [0.40;1.92] hours and 35.4 °C [34.3;36.2], respectively and 2.25 [1.88;4.53] hours and 33.5 °C [33.1;33.8] at admission to the referral center, respectively. In the 40 neonates that had body temperature above the target range upon the transport team's arrival at the referring hospital, target body temperature was reached at 1.75 [1.17;2.55] hours of age. In the referral center, core temperature remained in the target range in 29 of 47 neonates. Ten of the 47 neonates were hypotensive at the time of the team's arrival to the referring center (mean arterial pressure (MAP) <30 mmHg). Upon arrival to the referral center, 7 neonates had normal MBP and 3 were still hypotensive. Out of the 47 neonates, 22 received fluid boluses and 15 patients were on vasopressor-inotropic support. No occurrence of severe bradycardia (HR<60/min) was observed.

Conclusion: 1. Therapeutic hypothermia may be achieved by 1.75 hours of age by active induction of hypothermia.

2. The body temperature could be kept stable in the therapeutic range in 62 % of the cases.

3. No critical circulatory instability was observed

4. The condition of patients treated with active controlled hypothermia is likely to improve during transport.

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