

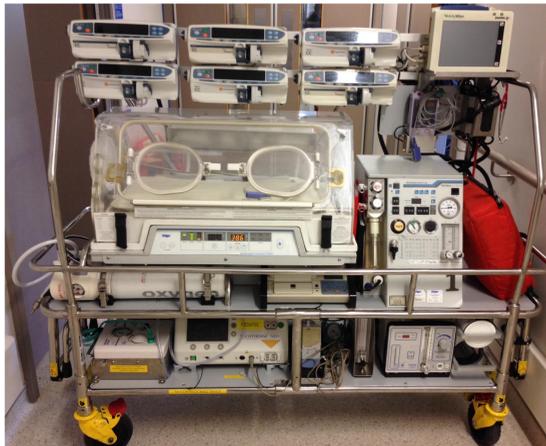
Therapeutic Hypothermia During Neonatal Transfer: Comparison of Passive vs Active Cooling

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INTRODUCTION

- Therapeutic hypothermia commenced after birth results in improved neuro-developmental outcomes in infants with moderate to severe hypoxic ischaemic encephalopathy.
- Important to achieve core target temperature of 33-34°C within six hours of birth.
- In centres where active cooling is not possible, the infants are passively cooled and transferred to the nearest cooling unit.
- Recently, with the availability of servo-controlled cooling equipment on transport, it is now possible to commence active cooling at referral unit by transfer teams



METHODS

- Retrospective data collection - infants referred for therapeutic hypothermia between July 2011 to June 2013 to the London Neonatal Transfer Service (NTS).
- Active hypothermia during transfer using servo-controlled cooling mattress (Tecotherm) commenced from Sept 12

AIMS

- Comparison of passively cooled vs actively cooled groups for temperature achieved during different stages of transfer
- Service evaluation for neonatal transfer related variables



RESULTS

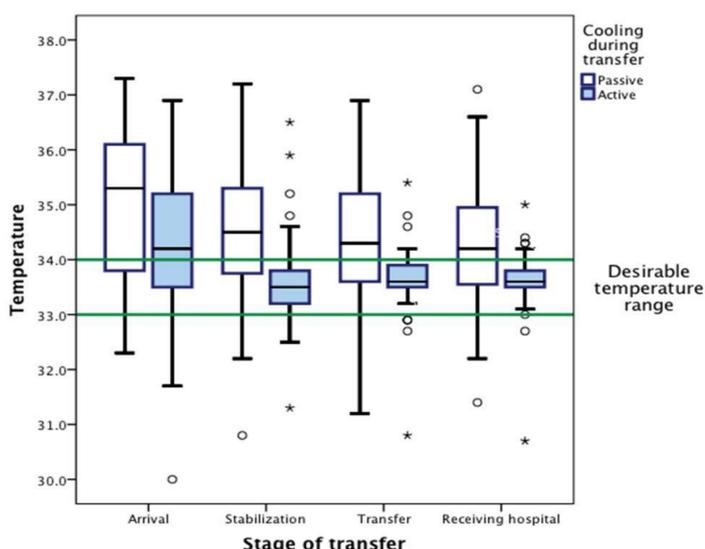
- 156 infants were transferred to a cooling centre.
- Data available on 145 infants – 76 were passively cooled, 69 were actively cooled (Table 1). The two groups were similar for patient demographics and transfer related variables apart from stabilization time and age at reaching target temperature.
- Stabilization time was significantly longer for active cooling group compared to passive cooling (median time 110 vs. 90 min, Mann Whitney U test, p=0.034) (Table -1).
- The proportion of infants within target temperature range were significantly higher at all stages of transfer in active cooling group (Figure 1)
- Median time to achieve target temperature was 30 (95%CI 23-37) min in actively cooled babies, which was significantly shorter in comparison to 130 (95% CI 83-177) minutes in passively cooled babies (Log rank chi sq =29.8, p<0.001) (Figure 2)

Table 1: Patient demographics and neonatal transfer related variables in two groups

	Passive cooled (n=76)	Active cooled (n=69)
Weight (gm)	3371 (±600)	3332 (±566)
Gestation (weeks)	40 (±1.6)	39.7 (±1.6)
Age at referral for cooling (min)	170.1 (±116.6)	159.4 (±106.5)
Temperature on arrival of NTS	34.9 (±1.37)°C	34.2 (±1.32)°C
<i>Data expressed as mean (±SD)</i>		
Dispatch time (min)	20 (15-37)	30 (15-72)
Age at arrival of transfer team (min)	230 (175-320)	220 (180-290)
Stabilization time (min)	90 (70-120)	110 (80-140)*
Age at target temperature (min)	325 (255-401)	270 (197-342)*
Age on reaching cooling centre (min)	390 (300-450)	375 (330-470)

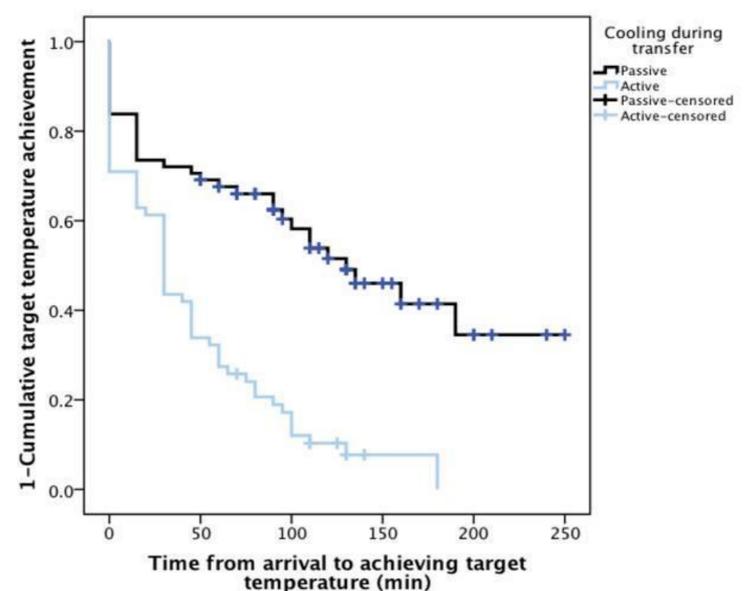
*Data expressed as median (interquartile range), * denotes p <0.05*

Figure 1: Box & whisker plot of temperatures achieved at each stages of transfer with table showing number of babies in 3 temperature ranges



Temperature	Arrival		Stabilization		Transfer		Receiving hospital	
	Passive	Active	Passive	Active	Passive	Active	Passive	Active
>34 °C	50	34	47	14	42	6	39	6
33-34 °C	10	21	14	42	19	50	25	54
<33 °C	8	7	7	6	5	5	4	2

Figure 2: Kaplan-Meier estimator showing time to achieve target temperature from arrival of transfer team



CONCLUSIONS

- Infants actively cooled during the transfer achieve target temperature for therapeutic hypothermia in a significantly shorter time period and achieve better temperature stability during the transfer.
- Although the stabilization times were longer, babies reached target temperature sooner and therefore active cooling should become the standard of care for achieving therapeutic hypothermia during neonatal transfer.