

On-line Table: Safety and feasibility of local endovascular brain cooling with intra-arterial infusion of cold fluids in animals

Reference	Animal	N Cooled (controls)	Weight (kg)	Cold Fluid	Infusion Temperature (°C)	Infusion Volume (Duration)	IA access (infusion)	Safety Evaluation: Mortality, Performance, Histology (Cooling Group)	Feasibility of Brain Cooling
Ohta et al (1992) ¹⁸	Dogs	17 (5)	8–12	Ringer's lactate	5 (0.5)	~2000 mL (60 minutes)	Vertebral artery	No death; behavior 10 weeks after procedure normal; histology: no brain ischemia	To 28°C in 5.4 minutes; to 20°C in 15.5 minutes
Ding et al (2002) ¹⁹	Rats	10 (29)	0.26–0.3	Saline	23 vs 37	7 mL (3–4 minutes)	MCA	No death; improved NeuroScore; endothelium intact	To 32–33°C in 3–4 minutes of 23°C infusion
Luan et al (2004) ²⁰	Rats	7 (15)	0.26–0.3	Saline	20 vs 37	6 mL (9 minutes)	MCA	No death; 48 hours after procedure histology normal	To 33.4°C in cortex/33.9°C striatum in 10 minutes local cooling
Zhao et al (2009) ²¹	Rats	28: 1.5 hours to 3 hours after ischemia (35)	0.26–0.3	Saline	20	6 mL (11 minutes)	MCA	Mortality not reported; significant benefit of cooling for up to 2.5 hours after ischemia	To 32.8–33.2°C in cortex and to 33.2–33.3°C striatum
Jiang et al (2006) ²²	Rhesus monkeys	7 (5)	6–10	Ringer's lactate	4	~1800 mL (63 minutes)	ICA	No death; 3 week motor function unaltered; histology: no neuronal loss	To 15.5°C in 19.8 minutes
Furuse et al (2007) ²³	Dogs	6 (none)	13.81 (0.6)	Ringer's lactate	6.5 (0.9)	~1200 mL (30 minutes)	Common carotid artery	No death; 8 weeks after procedure normal performance; histology: no ischemic lesions	Right hemisphere to 33.6°C, left hemisphere to 34.3°C in 30 minutes
Nishihara et al (2009) ²⁴	Dogs	15 (none)	10–15	Ringer's lactate	13	~600 mL vs 1200 mL (30 minutes)	Common carotid artery	N/A	Cooling rate/30 minutes: right 1.8°C, left 1.4°C, right 4.7°C, left 3.5°C; right 4.7°C, left 3.6°C

Note:—Brain temperature was measured with parenchymal needle thermistors in all animals.