Effect of remote ischemic preconditioning with remote ischemic postconditioning on neurologic outcomes in patients undergoing Superficial temporal artery–middle cerebral artery for moyamoya disease

Eunsu Choi, Sungjoo Park, Jinwoo Park, Young-tae Jeon

Department of Anesthesiology and Pain Medicine, Eulji General Hospital, Eulji University
Department of Anesthesiology and Pain Medicine, Seoul national university bundang hospital

Background and Goal of Study

Superficial temporal artery-middle cerebral artery (STA-MCA) anastomosis is the most commonly used treatment method for moyamoya disease. During surgery and postoperative period, patients are exposed not only cerebral hypoperfusion but also transient postoperative transient neurological deterioration due to cerebral hyperperfusion, which is a kind of ischemic - reperfusion injury. The aim of this study was to evaluate the effect Remote ischemic preconditioning (RIPC) with remote ischemic postconditioning (RIPostC) on neurologic complications in patients undergoing STA-MCA anastomosis.

METHOD

One hundred and eight patients planned for STA-MCA anastomosis were randomly assigned to a RIPC with RIPostC group (Group R, n=54) or a control group (Group C, n=54). In the RIPC with RIPostC group, 4 cycles of 5-min ischemia and 5-min reperfusion were done on a lower limb before craniotomy (RIPC) and after STA-MCA anastomosis (RIPostC). Anesthesia was induced and maintained with a target controlled infusion of remifentanyl and propofol (Orchestra infusion pumps: Fresenius Vial, Brezins, France). The primary endpoint was the incidence of major neurological complications. Major neurological complications were defined as hyperperfusion syndrome, seizure, epidural hemorrhage, subarachnoid hemorrhage, and acute infarction.

RESULT

Table 1. Demographic data

	Group C (n = 54)	Group R (n = 54)	P value
Age (year)	39.0 ± 10.7	37.2 ± 10.8	0.378
Height (cm)	164.7 ±6.7	164.6 ± 8.0	0.955
Weight (kg)	68.3 ± 14.7	68.5 ± 13.7	0.917
BMI	24.6 ± 4.6	24.7 ± 4.2	0.862
Operation time (min)	367.7 ±94.1	360.0 ± 65.6	0.623
Anesthetic time (min)	429.7 ± 106.3	436.0 ±71.7	0.719
ICU stay duration (day)	2.4 ± 1.0	2.1 ± 0.7	0.092
Hospital stay duration (day)	17.8 ± 11.3	13.8 ± 5.9	0.023*

Values are mean (standard deviation). BMI, body mass index.
* P value < 0.05

Table 2. Neurologic outcome

	Group C (n = 54)	Group R (n = 54)	P-value
TIA	28	25	0.7
Hypoperfusion complication			
Acute infacrction	8	2	0.093
Hyperperfusion complication			
Seizure	3	0	0.243
Hyperperfusion syndrome	2	1	1.00
Overall neurologic complication	13 (24%)	3 (5.5%)	0.013*

Values are number (percents). TIA, transient ischemic attack.
* P value < 0.05

CONCLUSION

Remote ischemic preconditioning with remote ischemic postconditioning can be effective in reducing the patient's neurologic outcome and also it appeared to reduce the duration of hospitalization

REFERENCE

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