FULL-LENGTH ARTICLE NPub.org/0wn0vn

Changes in cerebral autoregulation and blood biomarkers after remote ischemic preconditioning

Zhen-Ni Guo, MD, Wei-Tong Guo, MD, Jia Liu, PhD, et al.

Cite as: *Neurology*® 2019;93:e8-e19. doi:10.1212/WNL.0000000000007732

Correspondence
Dr. Yang
doctoryangyi@163.com

Study objective and summary result

This study tested the hypothesis that remote ischemic preconditioning (RIPC) improves dynamic cerebral autoregulation (dCA) and affects the levels of various neuroprotective and inflammation-related blood biomarkers. It found that RIPC did improve dCA at 6 and 24 hours and affects 2 neuroprotective and 5 inflammation-related blood biomarker levels.

What is known and what this paper adds

RIPC reduces infarct sizes after various ischemic events, but the underlying mechanisms remain unclear. The results here provide evidence that the mechanisms may involve improved dCA and altered blood biomarker levels.

Participants and setting

The study sample included 50 healthy adults (22 men; mean age, 34.54 ± 12.01 years) and was conducted through the First Hospital of Jilin University (Changchun, China) between January 2017 and July 2017.

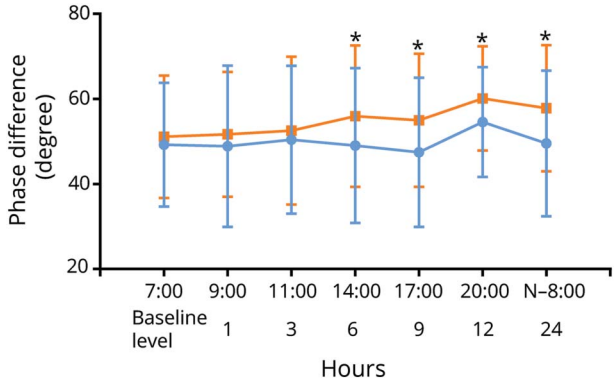
Design, size, and duration

The RIPC intervention consisted of 4 cycles of extremity ischemia: 5-minute blood-pressure cuff inflation to 200 mm Hg, followed by 5-minute cuff deflation. The tourniquets were applied to one upper arm and one thigh. Each participant completed the trial protocols over 4 consecutive days, with the first and second days being the control and the third and fourth days being the RIPC periods. Each participant underwent 7 serial dCA measurements between 7:00 AM on the first day and 8:00 AM on the second day during the control period. During the RIPC period, each participant underwent dCA measurements at analogous timepoints with the addition of an RIPC procedure between 7:20 AM and 8:00 AM on the third day. Blood samples were collected before and 1 hour after RIPC, and a quantitative protein chip was used to measure the levels of 30 neuroprotective and inflammation-related blood biomarkers. They used a mixed linear model to investigate the effects of RIPC on dCA measurements.

Primary outcome measures

The primary outcomes were the effects of RIPC on dCA.

Figure dCA measurements during the control (blue) and RIPC (orange) periods



*$p < 0.05$ in between-period comparisons.

Main results and the role of chance

Comparisons between the control and RIPC data showed that dCA levels during the RIPC period were elevated at ≥6-hour post-RIPC timepoints. RIPC altered the levels of 5 inflammation-related blood biomarkers and 2 neuroprotective blood biomarkers.

Bias, confounding, and other reasons for caution

Blood samples were collected at only 2 timepoints. The investigators used a small sample size.

Generalizability to other populations

The results obtained here may only be applicable to healthy adults.

Study funding/potential competing interests

This study was funded by the National Key R&D Program of China and the Program for JLU Science and Technology Innovative Research Team. The authors report no competing interests. Go to Neurology.org/N for full disclosures.

A draft of the short-form article was written by M. Dalefield, a writer with Editage, a division of Cactus Communications. The authors of the full-length article and the journal editors edited and approved the final version.

CORRECTIONS

Genetic variation in *PLEKHG1* is associated with white matter hyperintensities (n = 11,226)

Neurology® 2019;93:608. doi:10.1212/WNL.0000000000007914

In the article "Genetic variation in *PLEKHG1* is associated with white matter hyperintensities (n = 11,226)" by Traylor et al.,[1] first published online January 18, 2019, Dr. Danuta M. Lisiecka-Ford's last name should have appeared hyphenated. The editorial office regrets the error.

Reference

1. Traylor M, Tozer DJ, Croall ID, et al. Genetic variation in *PLEKHG1* is associated with white matter hyperintensities (n = 11,226). Neurology 2019; 92:e749–e757.

Incidence of frontotemporal lobar degeneration in Italy

The Salento-Brescia Registry study

Neurology® 2019;93:608. doi:10.1212/WNL.0000000000008185

In the article "Incidence of frontotemporal lobar degeneration in Italy: The Salento-Brescia Registry study" by Logroscino et al.,[1] first published online April 12, 2019, the institutional affiliation for Drs. Binetti, Fostinelli, Benussi, Ghidoni, and Cappa should have been "IRCCS Istituto Centro San Giovanni di Dio Fatebenefratelli, Brescia." The authors regret the error.

Reference

1. Logroscino G, Piccininni M, Binetti G, et al. Incidence of frontotemporal lobar degeneration in Italy: the Salento-Brescia Registry study. Neurology 2019;92:e2355–e2363.

Changes in cerebral autoregulation and blood biomarkers after remote ischemic preconditioning

Neurology® 2019;93:608. doi:10.1212/WNL.0000000000008351

In the article "Changes in cerebral autoregulation and blood biomarkers after remote ischemic preconditioning" by Guo et al.,[1] first published online May 30, 2019, in figure 4A, the GDNF measurement should have been pg/mL. It appears correctly in the July 2, 2019, issue. The authors regret the error.

Reference

1. Guo ZN, Guo WT, Liu J, et al. Changes in cerebral autoregulation and blood biomarkers after remote ischemic preconditioning. Neurology 2019;93:e8–e19.

Iron deposition in periaqueductal gray matter as a potential biomarker for chronic migraine

Neurology® 2019;93:608. doi:10.1212/WNL.0000000000007921

In the article "Iron deposition in periaqueductal gray matter as a potential biomarker for chronic migraine" by Domínguez et al.,[1] first published online February 1, 2019, and in print March 5, 2019, in figure 2, there should not be a second row of values under panel B: PAG iron volume (microL). The authors regret the error.

Reference

1. Domínguez C, López A, Ramos-Cabrer P, et al. Iron deposition in periaqueductal gray matter as a potential biomarker for chronic migraine. Neurology 2019;92:e1076–e1085.

