Remote ischemic conditioning

Remote ischemic conditioning (RIC) is an experimental medical procedure that aims to reduce the severity of ischaemic injury to an organ such as the heart or the brain, most commonly in the situation of a heart attack or a stroke, or during procedures such as heart surgery when the heart may temporarily suffer ischemia during the operation, by triggering the body's natural protection against tissue injury.

Although noted to have some benefits in experimental models in animals, this is still an experimental procedure in humans and initial evidence from small studies has not been replicated in larger clinical trials. Successive clinical trials have failed to identify evidence supporting a protective role in humans.

Exploratory studies have shown that remote ischemic conditioning (RIC) has the potential to lower blood pressure (BP). Guo et al. investigated whether chronic RIC reduces BP for hypertension.

A multicenter, randomized, double-blind, parallel-controlled trial. Patients with an office BP of 130/80 to 160/100 mm Hg and a 24-hour average BP ≥125/75 mm Hg not on antihypertensive medications were recruited. After a 1-week compliance screening phase, they were randomly assigned in a 1:1 ratio to receive RIC or sham RIC twice daily for 4 weeks. The primary efficacy outcome was the change in 24-hour average systolic BP from baseline to 4 weeks. Safety events were assessed over the study period.

Ninety-five participants were randomly allocated to the RIC (n=49) and sham RIC (n=46) groups. In the intention-to-treat analysis, the reduction in 24-hour average systolic BP was greater in the RIC group than the sham RIC group (-4.6±9.5 versus -0.9±6.8 mm Hg; baseline-adjusted between-group mean difference: -3.6 mm Hg [95% CI, -6.9 to -0.3 mm Hg]; adjusted P=0.035). The per-protocol analysis showed that 24-hour average systolic BP reduced -5.9±8.6 mm Hg in the RIC group and -0.7±6.7 mm Hg in the sham RIC group (baseline-adjusted between-group mean difference: -5.2 mm Hg [95% CI, -8.5 to -1.9 mm Hg]; adjusted P=0.002). No major adverse events were reported in both group.

RIC is safe in patients with mild hypertension and may lower BP in the absence of antihypertensive medications. However, the effects of RIC on clinical outcomes in these patients require further investigation [1)]

One-time RIC interventions may show seemingly coexisted proinflammatory and anti-coagulation effects of a single bout on patients with cerebral arteriostenosis. Older age was a negative predictor for multiple biomarkers in the cerebral arteriostensosis group. The protective effect of RIC on cerebral venostenosis patients needs to be further studied in a larger sample size [2)].

1)
Guo W, Zhao W, Li D, Jia H, Ren C, Li S, Zhao J, Yu B, Dong J, Guo R, Zhu K, Cao Y, Wang Y, Wang Y, Li Z, Wang Z, Wang D, Hou C, Hausenloy DJ, Chu X, Ji X. Chronic Remote Ischemic Conditioning on Mild Hypertension in the Absence of Antihypertensive Medication: a Multicenter, Randomized, Double-

Blind, Proof-of-Concept Clinical Trial. Hypertension. 2023 Apr 10. doi: 10.1161/HYPERTENSIONAHA.122.20934. Epub ahead of print. PMID: 37035920.
2)
Song SY, Jiao BL, Lan D, Liu YH, Wan SL, Guo YB, Ding YC, Ji XM, Meng R. Potential Anti-Inflammatory and Anti-Coagulation Effects of One-Time Application of Remote Ischemic Conditioning in Patients With Subacute/Chronic Cerebral Arteriostenosis and Venostenosis. Neurologist. 2022 Jun 8. doi: 10.1097/NRL.0000000000000425. Epub ahead of print. PMID: 35680386.