LETTERS TO THE EDITOR

Regarding "Remote and local ischemic preconditioning equivalently protects rat skeletal muscle mitochondrial function during experimental aortic cross-clamping"

Mansour et al[1] showed that local and remote ischemic preconditioning (LIPC and RIPC) protect skeletal muscle against ischemia reperfusion-induced mitochondrial dysfunction during aortic cross-clamping. Based on these results, the authors advocate a broader use of RIPC in the setting of vascular surgery. Recently, we performed a systematic review and meta-analysis of animal studies investigating the effects of ischemic preconditioning on ischemia-reperfusion injury (IRI) of the kidney.[2] Our analysis showed that LIPC and RIPC are equally effective in the protection against renal IRI and therefore support the conclusion by Mansour et al[1] that LIPC and RIPC equivalently protects against skeletal muscle IRI.

To date, no studies (animal or human) have investigated the effect of aging, medication, and comorbidities such as diabetes, hypertension, or obesity on RIPC in skeletal muscle or renal IRI. For the heart, it has been shown that aging, medication, and comorbidities influence ischemic preconditioning efficacy.[3] In the study by Mansour et al,[1] and also in the majority of other animal studies investigating the effects of ischemic preconditioning, healthy young adult animals have been used. Therefore, the question arises whether the efficacy of RIPC holds for patients with cardiovascular (co)-morbidity. In our view, testing of suboptimal RIPC protocols in large clinical trials could unnecessarily delay implementation into routine clinical practice, due to marginal or negative results.

Interestingly, our meta-analysis also revealed that the "late window of protection" (RIPC >24 hours before index ischemia) was more effective as compared to the "early window of protection" (RIPC ≤24 hours). Therefore, activation of both (early and late) windows of protection by RIPC might also result in improved protection against IRI of human skeletal muscle and other target organs. Because patients undergoing major vascular surgery are exposed to a significant risk of myocardial and renal IRI, we believe that the RIPC protocol should be optimized for different target organs in vascular patients. Almost all clinical trials currently registered at http://Clinicaltrials.gov investigating the effects of RIPC use the early window of protection. To our knowledge, data on the efficacy of combined activation of the early and late window in humans are lacking. Therefore, we believe that further (pre)clinical research is required to optimize the RIPC protocol in cardiovascular patients before a broader implementation in vascular surgery.

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Reply

We appreciate Dr Menting and colleague's comments and agreement on the fact that local and remote ischemic preconditioning (IPC and rIPC) proved equivalent protection on skeletal muscle and kidneys during ischemia-reperfusion. A similar protection was also observed on other target organs.[1-3] Further, unlike postconditioning,[4] IPC and rIPC have not been demonstrated to be deleterious on skeletal muscle.

Nevertheless, whether efficacy of IPC and rIPC holds true in vascular patients characterized by comorbidities remains a significant issue because conditioning-related cardioprotective properties appeared reduced in presence of diabetes, hypercholesterolemia, or older age. Additionally, specific organ sensitivity to ischemia-reperfusion, oxidative stress, and inflammation might also be key limiting factors of IPC and rIPC protective effects. Thus, a protocol algorithm might well protect one organ and not the others.

Should we therefore wait until all light to be made on the mechanisms involved in IPC and rIPC beneficial effects and on eventual ischemic preconditioning drawbacks? As suggested by Menting et al, a way to overcome such potential limitations might be combination use of both early and late windows of protection. Combined ischemic conditioning and pharmacologic approaches might also be useful to optimize conditioning protocols.

In the clinical setting, Ali et al[5] proved in a randomized controlled trial that rIPC reduced myocardial and renal injury after abdominal aortic cross-clamping for elective abdominal aortic aneurysm repair. Despite comorbidities, preconditioned patients presented with better outcomes than not conditioned patients.

Acknowledging that experimental data are still needed and that, based on current evidence from small pilot trials, there are too few data to be able to say whether IPC has consistent beneficial effects,[6] we nevertheless believe that implementation of personalized IPC protocols should not be delayed into clinical practice. Large scale controlled studies should be performed to determine whether IPC will protect patients during their hospital stay, therefore improving their surgical overall outcomes.

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Regarding "Factors affecting career choice among the next generation of academic vascular surgeons"

I was delighted to read your Web survey of residents and their choice for a career in academic vascular surgery in America.[1] This is indeed one of the few studies examining the actual factors that influence a young vascular surgeon's choice in embarking on an academic and educational career. There are similar parallels with the career choices of young vascular surgeons in the United Kingdom to those of your study.

In the United Kingdom, there is a new academic pathway where, from a medical school perspective, students can embark on an academic foundation program, which enables them throughout their first and second years post-medical school to embark on an academic theme throughout their training. They are then encouraged to apply for an academic clinical fellow job where they will pursue a high degree such as a Doctorate in Medicine (MD) or a Doctorate of Philosophy (PhD). Following on from this extended period of 2 to 3 years of research and on embarking on a vascular or general surgical rotation, they can then apply to become an academic clinical lecturer. The role of an academic clinical lecturer is to practice and learn surgery 50% of the time and continue academic pursuits in the other 50%. This is for approximately 4 years, and during this period, grants are attained to further the young surgeons' academic interests and projects as well as supervising projects of BSc, PhD, and MD students.

The only limitation with this new run-through academic training is the fact that clinical training is reduced in comparison with a nonacademic training. Also, the uncertainty of becoming a senior lecturer at an institution is always there in the back of the mind. However, embarking on these career pathways also offers some stability because they are usually based in one particular unit in the hospital, and, usually due to affiliations within the department, it is likely that one will take up a permanent post in the department if one is available.

I myself am interested in an academic vascular surgical career; however, I am not entirely convinced of the quality and quantity of clinical training in these posts. These posts appeared to be adopted by a similar proportion of males and females. However, the numbers who wish to embark on an academic vascular surgical career are small throughout the United Kingdom. With centralization of services and reduced hours, we are finding clinical training more and more extremely difficult. What do the authors feel about embarking on a traditional surgical career and then having an academic interest as many have done in the past?

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Reply

We appreciate the informative letter. There are indeed many barriers to preparing for and succeeding in an academic career. While some such barriers are somewhat generic (ie, common to all surgeons), others may be institution- and country-specific. Mechanisms to overcome these barriers are also likely to be both generic and institution- and country-specific. Our study examined what are, in essence, generic factors important to vascular trainees when deciding whether to choose a career in academic vascular surgery and suggests that young vascular surgeons entering the academic arena desire mentorship, research and teaching opportunities, a clinically busy practice offering a variety of open and endovascular procedures, and the ability to work with like-minded individuals. However, the unfortunate reality is that, in the last decade, medical institutions in the United States have placed more emphasis on clinical productivity, as it generates funding for the hospital and the medical school. This drive to increase clinical activity has had the effect of making it more difficult for academic surgeons in the United States to also engage in and excel in research and teaching activities.

Creating divergent pathways for academic and clinical training as outlined in the letter is a potential solution to the pressures of trying to excel in both academic and clinical endeavors, provided both tracks are equally valued within institutions. However, in our opinion, for a surgeon, academic excellence should not come at the expense of clinical competence. Clinical competence is always paramount. If the program outlined in the letter, combined with local barriers to training, does not permit training of a clinically competent and confident surgeon, the new paradigm will either fail or result in two classes of surgeons within the United Kingdom. Obviously, both are undesirable outcomes. Similar to the new 0/5 training paradigm for vascular surgeons in the United States, the United Kingdom academic pathway will require careful ongoing assessment and re-evaluation. It is my hope that leaders in surgical education worldwide remain keenly aware of the angst facing the surgeon contemplating an academic career and engage young people in finding local solutions to common problems.

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Regarding "Long-term incidence of myocardial infarct, stroke, and mortality in patients operated on for abdominal aortic aneurysms"

We have read with keen interest the article by Eldrup et al[1] on the long-term incidence of myocardial infarction, stroke, and death in patients operated on for abdominal aortic aneurysm (AAA). The study is based on an impressive series of 11,094 patients who