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Commentary: It's not all in the sauce

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Suarez-Pierre and colleagues¹ examined the effects of diazoxide on myocardial protection in open-chest pigs with hypothermic cardioplegic arrest. The authors conclude that diazoxide preserves systolic and diastolic ventricular function in a large animal model of prolonged global myocardial ischemia and that diazoxide as an adjunct to hypothermic cardioplegia may allow safer prolonged ischemic times during increasingly complicated cardiac procedures.

Although the power of this study is limited by small animal numbers, the study may provide some of the strongest evidence to date that diazoxide added to cold blood cardioplegia can improve myocardial protection. Diazoxide has a history of being beneficial in animal models of ischemia.^{2,3} Diazoxide is believed to work by opening adenosine triphosphate-sensitive potassium channels, inhibiting action potentials, and minimizing myocardial edema. In this animal study, detailed functional, biochemical, and histologic measures of injury demonstrated benefit from diazoxide. Yet, proving benefit of cardioplegia additives in humans has been difficult due to difficulty measuring myocardial injury in humans, the low incidence of obvious cardiac injury in humans, and the multitude of other factors that affect myoprotection in clinical practice.^{4,5} In fact, over the past 30 years, little has changed in the science and practice of myocardial protection other than the methods of del Nido.⁶

Diazoxide is among many chemical additives that have been found to potentially contribute to myocardial protection. Others include membrane stabilizers, buffers, calcium channel blockers, antioxidants, selected electrolytes, nitric oxide, and more.⁷ This well-designed small pilot study

CENTRAL MESSAGE

Diazoxide preserves systolic and diastolic ventricular function in a large animal model of prolonged global myocardial ischemia.

will need confirmation in animals and then ultimately in humans.³ This work may offer incrementally improved myocardial protection during hypothermia, especially in long aortic crossclamp times and in donor heart preservation. We do not know if diazoxide will be beneficial in cases of continuous warm cardioplegia without ischemia.

Whereas chemical additives like diazoxide can improve myocardial protection to some extent, one must remember that temperature, delivery volume, and dose frequency are all also important. Thus, when it comes to cardioplegia recipes, it's not all in the sauce.

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