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DOI: 10.1097/CCM.0000000000003706

Angiotensin II: Time to Study Starting a Stopped Heart

To the Editor:

As demonstrated in their recently published article in *Critical Care Medicine*, Moskowitz et al (1) highlight that the evolution in medication regimens used to treat cardiac arrest reflects temporal changes in practice guidelines. Such guidelines change based on the emergence of novel high-quality data that demonstrate a therapy's ability to alter the desired clinical outcome. Despite widespread adherence to clinical guidelines for managing cardiac arrest, rates of return of spontaneous circulation (ROSC) remain woefully inadequate, making it imperative that we explore better alternatives to existing therapies and protocols.

Among the medications administered during cardiac arrest, vasopressors serve a particularly important role to increase systemic afterload, which leads to increased coronary perfusion pressure. Unfortunately, however, vasopressors are fraught with various side effects and challenges unique to each medication class. For example, catecholamines increase rates of dysrhythmias as compared with noncatecholamines (2), and less than half of septic shock patients even mount an adequate blood pressure response to vasopressin (3).

Previously, we reported 18 historical cases of cardiac arrest in which angiotensin II use resulted in ROSC in 14 of those patients (4). Given the retrospective nature of these cases, limited conclusions can be made; however, the concept of using angiotensin II for cardiac arrest is certainly intriguing. Deficiencies in angiotensin-converting enzyme (ACE) are prevalent and injurious and can be associated with decreased levels of angiotensin II (5). Furthermore, ACE inhibitors are a commonly prescribed first-line therapy for a variety of indications that include hypertension and heart failure, which are both risk factors for coronary disease and cardiac arrest, respectively. Such medications are, for obvious reasons, associated with decreased angiotensin II levels.

As outlined above, the poor rates of ROSC and challenges surrounding existing therapies, the prevalence of ACE inhibitor use, and multiple case reports observing the successful use of angiotensin II in cardiac arrest underscore the need to rethink how we approach this problem. The renin-angiotensin-aldosterone system serves an integral role in the maintenance of blood pressure regulation, yet this entire pathway has largely been ignored for increasing afterload in the setting of cardiac arrest. Maybe the time is right to conduct high-quality clinical trials assessing the effectiveness of angiotensin II for treating cardiac arrest, and hopefully, we will know before the next round of guideline revisions whether this therapy warrants inclusion.

Drs. McCurdy, Khanna, and Busse received funding from La Jolla Pharmaceuticals. Drs. McCurdy and Khanna disclosed off-label product use of angiotensin II in resuscitation.

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