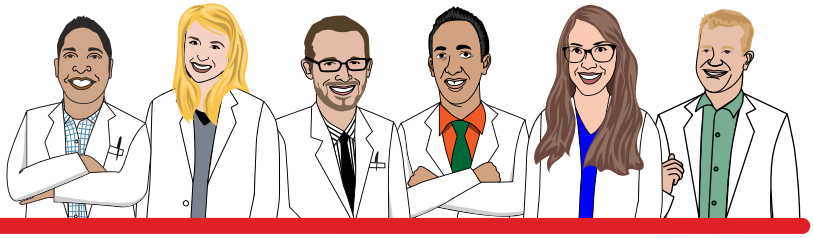
Emergency Medical Abstracts



Editor-in-Chief: Mel Herbert, MD
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Abstract Editor: Whitney Johnson MD

Effect of vasopressin and methylprednisolone vs placebo on return of spontaneous circulation in patients with in-hospital cardiac arrest: a randomized clinical trial

Andersen LW, Isbye D, Kjærgaard J, et al. JAMA. 2021;326(16):1586-1594.

SUMMARY:

- Only 25% of patients with in-hospital cardiac arrest have been reported to survive until discharge. The current recommendations and general advanced cardiac life support (ACLS) protocol focus on early recognition and optimization of chest compressions. In the past decade, many studies have examined strategies for management of arrest in the out-of-hospital setting, including the potential use of vasopressin and steroids. However, few studies have explored interventions to improve outcomes for in-hospital arrests.
- Only 2 small RCTs have recently evaluated the utility of steroids and vasopressin during in-hospital ACLS.
- Theoretically, vasopressin can cause vasoconstriction, thus increasing arterial blood pressure and coronary perfusion pressure, which together may improve the chances of obtaining return of spontaneous circulation (ROSC). Animal studies have evaluated the use of steroids to increase cortisol levels, which may also increase the chances of achieving ROSC.
- Although some trends suggest potential improvements in ROSC with the early introduction of these adjuncts, ACLS has not formally adopted these strategies.
- This study focused on in-hospital cardiac arrest, seeking to determine whether the combination of vasopressin and methylprednisolone might improve ROSC for in-hospital cardiac arrest.
- This was a multicenter randomized controlled trial in 10 hospitals in Denmark on approximately 500 adult patients with cardiopulmonary arrest.
- The study groups were (1) a control group, in which the standard ACLS protocol was followed and paired with administration of epinephrine and saline, and (2) an intervention group, in which the standard ACLS protocol was followed and paired with administration of epinephrine, vasopressin, and steroids. In the intervention group, each dose of epinephrine was immediately followed by 40 mg of methylprednisolone and 20 units of vasopressin for up to 4 rounds of CPR.
- The primary outcome was ROSC achievement. The secondary outcomes were any effects on favorable neurologic outcomes at 30 days.
- The general patient population was 64% men with an average age of 71 years. The randomization was good, and the groups were fairly balanced.
- Most in-hospital arrests occurred in medical and medical-surgical units. Approximately 90% of patients presented with an initial nonshockable rhythm (predominantly pulseless electrical activity). In both groups, the first dose of medications was administered in only 5-8 minutes.
- In the intervention group, approximately 42% of patients achieved ROSC, compared with 33% in the control group.
- In the subgroup analysis, the main features of the patients in the intervention group included an initial shockable rhythm, younger age, witnessed arrest, and early administration of ACLS medications.
- The study had several limitations, including an overall lack of generalizability according to patient demographics as well as a lack of consistent early administration. The authors noted that although most patients received an initial dose of medications within 8 minutes, some instances of late delivery occurred.

PMID: 34587236

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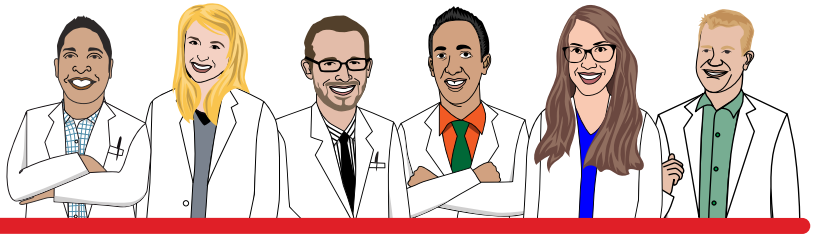

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EDITOR'S COMMENTARY: This is a large RCT examining the incidence of ROSC in patients with in-hospital cardiac arrest and utilizing ACLS protocols coupled with administration of vasopressin and steroids. The results showed a higher percentage of ROSC in patients who received adjunct medications. However, for most of us, the endpoint that matters is neurologically meaningful survival, which these medications do not change. Overall, this study establishes that these adjuncts paired with the standard ACLS algorithm are more likely to lead to ROSC but may not necessarily improve functional patient outcomes.

RELATED SEGMENTS:

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CorePendium: Cardiac Arrest

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