PACU LITERATURE REVIEW

REFERENCE

Niederberger SM, Crowe RP, Salcido DD, Menegazzi JJ. Sodium bicarbonate administration is associated with improved survival in asystolic and PEA Out-of-Hospital cardiac arrest. *Resuscitation*. 2023;182:109641.

PMID: 36403821

SUMMARY

In a retrospective cross-sectional study, pre-hospital administration of sodium bicarb to OHCA patients with an initial rhythm of asystole or PEA, was associated with improved survival. There was no difference in outcomes for patients with an initial rhythm of ventricular fibrillation or pulseless ventricular tachycardia.

BACKGROUND

- Sodium bicarbonate ("bicarb") administration in out-of-hospital cardiac arrest (OHCA) has been used for four decades, but its effectiveness has limited evidence
- Bicarb is thought to combat acidosis arising during cardiac arrest by buffering acid-base imbalances, though literature is mixed on if this has a positive or negative impact on outcomes

STUDY OBJECTIVE

- To investigate the use of bicarb in OHCA and associated outcomes

STUDY DESIGN

- Nationwide, retrospective cross-sectional study

STUDY INTERVENTION & COMPARISON

- **Prehospital bicarb administration vs matched control**

RESULTS

- **Primary Outcome**
  - Asystole
    - Bicarb associated with higher rates of EMS ROSC (10.6% v 8.8%, p=0.013) and survival (3.3% v 2.4%, p=0.02)
  - PEA
    - Bicarb associated with higher rates of survival (8.1% v 5.4%, p=0.034), but not EMS ROSC (25.2% v 24.3%, p=0.681)
  - VF/VT
    - No difference in EMS ROSC (28.8% v 30.5%, p=0.535) or survival (12.8% v 13.5%, p=0.731)
  - All cases
    - Bicarb associated with higher rates of survival (5.28% v 4.3%, p=0.019) but not EMS ROSC (15.2% v 14%, p=0.094)

ADDITIONAL READINGS

- Wu KH, Chang CY, Chen YC, Chang CP, Hsiao CT, Weng HH. Effectiveness of Sodium Bicarbonate Administration on Mortality in Cardiac Arrest Patients: A Systematic Review and Meta-analysis. *J Emerg Med*. 2020 Dec;59(6):856-864. doi: 10.1016/j.jemermed.2020.08.012.
- Ahn S, et al. Sodium bicarbonate on severe metabolic acidosis during prolonged cardiopulmonary resuscitation: a double-blind, randomized, placebo-controlled pilot study. *J Thorac Dis*. 2018 Apr;10(4):2295-2302
- Kawano T, et al. Prehospital sodium bicarbonate use could worsen long term survival with favorable neurological recovery among patients with out-of-hospital cardiac arrest. *Resuscitation*. 2017 Oct;119:63-69.
- Chen YC, et al. The association of emergency department administration of sodium bicarbonate after out of hospital cardiac arrest with outcomes. *Am J Emerg Med*. 2018 Mar 5. pii: S0735-6757(18)30187-6.
- https://pharm-so-hard.com/2021/05/22/the-beef-with-bicarb-part-3-the-use-of-sodium-bicarbonate-in-cardiac-arrest-by-jimmy-pruitt/