

Paramedic - Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: *The prehospital use of epinephrine in cardiac arrest*

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Clinical Scenario:

You are called to a local shopping mall for a 60-year-old male patient in cardiac arrest. The arrest was witnessed by bystanders and when you arrive on scene CPR is in progress.

PICO (Population – Intervention – Comparison – Outcome) Question:

In prehospital cardiac arrest does the use of epinephrine vs not using epinephrine impact survival to discharge with favourable neurological outcomes?

Search Strategy:

((((Epinephrine OR Adrenaline)))) AND (((("Cardiac Arrest" OR "Ventricular Fibrillation" OR "Asystole" OR "Ventricular Tachycardia")))) AND ((Prehospital OR "out of hospital" OR "emergency medical services" OR Paramedic))

Search Outcome:

440 Hits



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Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Lin S. 2014	12,246 adult patients in cardiac arrest prehospitally	Systematic Review and meta-analysis	<p>Primary: survival to hospital discharge</p> <p>Secondary: ROSC, survival to hospital admission and good neurological outcome at hospital discharge.</p>	<p>Single dose Adrenaline (SDH) vs Placebo - One trial (n = 534) compared SDA to placebo. Patients who received SDA had higher rates of prehospital ROSC (RR 2.80, 95% CI 1.78-4.41, p < 0.00001) and survival to admission (RR 1.95, 95% CI 1.34-2.84, p = 0.0004) compared to those who received placebo. There were no significant differences in survival to discharge (RR 2.12, 95% CI 0.75-6.02, p = 0.16) and neurological outcome (RR 1.73, 95% CI 0.59-5.11, p=0.32) between patients who received SDA compared to those who received placebo.</p> <p>SDA vs. High dose adrenaline - Six trials (n = 6174) compared SDA to HDA. Meta-analysis</p>	<p>This meta-analysis is very generalizable due to its large sample size leading me to feel confident about the results of this study.</p> <p>This meta-analysis doesn't look at the differences in hospital therapies after hospital admission. These therapies can be confounding factors.</p>



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				<p>showed decreased ROSC (RR 0.85; 95% CI 0.75–0.97, $p = 0.02$; $I^2 = 48\%$) and survival to admission (RR 0.87, 95% CI 0.76–1.00, $p = 0.049$; $I^2 = 34\%$) in the SDA group compared to HAD. There were no differences in survival to discharge (RR 1.04, 95% CI 0.76–1.42, $p = 0.83$; $I^2 = 0\%$) and neurological outcome (RR 1.20, 95% CI 0.74–1.96, $p = 0.46$; $I^2 = 0\%$) between SDA and HDA.</p> <p>SDA vs Adrenaline/vasopressin - Six trials (n = 5202) compared SDA to adrenaline and vasopressin combination. There were no differences in ROSC (RR 0.96, 95% CI 0.89–1.04, $p = 0.31$; $I^2 = 0\%$), survival to admission (RR 0.88, 95% CI 0.73–1.06, $p = 0.17$; $I^2 = 56\%$), survival to discharge (RR 1.00, 95% CI 0.69–1.44, $p = 0.99$; $I^2 = 25\%$), and neurological</p>	
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				<p>outcome (RR 1.32, 95% CI 0.88–1.98, p = 0.18; I^2 = 0%) among patients who were treated with SDA compared to adrenaline/vasopressin</p> <p>SDA vs. Vasopressin alone - One trial (n = 336) compared SDA to vasopressin alone. There were no differences in ROSC (RR 0.93, 95% CI 0.66–1.31, p = 0.67), survival to discharge (RR 0.68, 95% CI 0.25–1.82, p = 0.44), and neurological outcome (RR 0.68, 95% CI 0.25–1.82, p = 0.44) between patients who received SDA compared to vasopressin alone. Survival to admission was not assessed in this trial.</p>	
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Perkins G.D. 2018	8014 adult EMS patients in cardiac arrest prehospitally	Double blind, randomized control trial. Level I	Primary: survival to hospital discharge in 30 days Secondary: survival to discharge with favourable neurological outcomes	Primary: 130 patients or 3.2% survived to 30 days with administration of epinephrine vs. 94 patients or 2.4% who received placebo saline. P=0.02 and is statistically significant. Secondary: 87 patients or 2.2% survived to discharge with favorable neurological outcomes with administration of epinephrine vs 1.9% who received placebo saline and is not statistically significantly.	I trust this study because it has good randomization and it was a double-blind study that met their sample size of 8000. The only flaws found would be that the CPR quality was only monitored for the first 5 minutes of the cardiac arrest and involved fewer than 5% of the enrolled patients. CPR quality could have worsened past this point.
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Comments:

There was a lot information on the use of epinephrine in prehospital cardiac arrest pertaining to ROSC outcomes, however more research needs to be done with the primary outcome looking at if there are favourable neurological outcomes.

Consider:

I would not change my practise as of right now because there is not enough evidence in the research to have a good understanding of the neurological outcome of patients.

Clinical Bottom Line:

Based on the research I've found, it shows that epinephrine in prehospital cardiac arrest setting has a higher ROSC rate but survival to discharge with favourable neurological outcome is unclear.

References:

Steve Lin et al. "Adrenaline for out-of-hospital cardiac arrest resuscitation: a systematic review and meta-analysis of randomized control trials" Resuscitation 85(2014)732-740

G.D. Perkins et al. "A Randomized Trial of Epinephrine in Out-of-Hospital Cardiac Arrest" The New England Journal of Medicine. Vol. 379

