Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: Adenosine versus calcium channel antagonists for treatment of supraventricular tachycardia

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Clinical Scenario:

You are assessing a 29YOF presenting with heart palpitations. Post assessment your working diagnosis is a clinically stable SVT. Patient has a previous history of chemical cardioversion via adenosine, with negative adverse effects. No conversion was noted via vagal maneuvers. Treatment is then initiated via calcium channel blocker.

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

P – Patients > 10 years of age, who presented to the ED with SVT, not converted with vagal maneuvers
I – Calcium Channel Blocker infusion
C – Adenosine Bolus
O – Conversion to sinus rhythm

Search Strategy:

((adenosine) AND (calcium channel blocker)) AND (SVT)

Search Outcome:
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Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
S. H. LIM, 2009	*Who did they study and how many?* *-206 adult patients presenting with SVT in the emergency setting*	*What study design was used?* *-RCT* *What level of evidence is this?* *-Level I, study was a RCT* *-Direction of evidence is Green*	*This is what the author was looking for.* *-Conversion of SVT to a sinus rhythm*	*These are the actual numbers they found. Include p-value or confidence interval if provided.* • *The conversion rates for calcium channel blockers were 100/102 (98%) and the adenosine group were 90/104 (86.5%)* • *P=0.002* • *RR 1.13 (95% CI 1.04-1.23)* *NNT 9 (1 additional conversion with calcium channel blockers)*	*Were there flaws?* *-Small sample size* *-did not meet goal sample size, goal was 115 patients on each arm of the study* *Small sample size?* *-Yes* *Generalizable to the EMS setting?* *-Yes, transferrable to EMS setting as these interventions could be performed in the field.* *Good randomization?* *-Yes, full randomization* *…Basically tell me if you trust this study and why.*

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					-Yes, this is a powerful RCT. Level I evidence. Results are statistically significant.
Samer Alabed, 2017	*-622 adult patients presenting with SVT in the emergency setting*	*-Systematic review of 7 RCTs* *-Level I evidence.* *-Direction of evidence is Green*	*-Conversion of SVT to a sinus rhythm*	*-89.7% conversion rate in Adenosine group vs 92.9% in calcium channel blocker group* *-Odds ratio of 1.51* *-95% CI 0.85-2.68*	-Flaws were present, such as a small sample sizes -Yes, this could be generalizable to the EMS. These interventions could be performed in the field. -Yes, systematic review of 7 RCTs -Yes, this systematic review yielded interesting results from 7 RCTs, strong evidence.

Comments:

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None.

Consider:

We would consider not changing practice because not all studies proved a statistically significant difference between control and treatment groups in conversion of SVT.

Clinical Bottom Line:

Calcium channel blockers have shown to be as safe and effective as adenosine in converting SVT. Calcium channel blockers have also shown improved patient comfort. Further review is required to assess feasibility before implementation to EMS practice.

References:

Lim, S. H., Anantharaman, V., Teo, W. S., & Chan, Y. H. (2009). Slow infusion of calcium channel blockers compared with intravenous adenosine in the emergency treatment of supraventricular tachycardia. *Resuscitation*, *80*(5), 523–528. https://doi.org/10.1016/j.resuscitation.2009.01.017

Alabed, S., Sabouni, A., Providencia, R., Atallah, E., Qintar, M., & Chico, T. J. A. (2017). Adenosine versus intravenous calcium channel antagonists for supraventricular tachycardia. *Cochrane Database of Systematic Reviews*. https://doi.org/10.1002/14651858.cd005154.pub4

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