

Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: Single Syringe administration of Adenosine for SVT

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Clinical Scenario: *you are called to treat a 23 yr old male patient experiencing a racing heart. Upon examination you find that the patient has a pulse of 190. Patient is Alert and orientated, all other vital signs are within normal limits. You confirm with your cardiac monitor that the patient is experiencing supraventricular tachycardia. The patient presents as a stable SVT and you decide to administer adenosine. It is just you and your partner on scene , with limited hands available you consider if there is a more efficient way to administer the drug than the traditional two syringe or stopcock method.*

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

P- patients with narrow complex, regular rhythm SVT needing adenosine

I- administer 6mg adenosine in combination with 18ml normal saline in a single syringe method

C- compared to administration of 6 mg of adenosine followed by a rapid 20ml normal saline flush, using 2 separate syringes .

O- measure the percentage patients with successful conversion of SVT to NSR after 1st dose and adverse effects secondary to administration technique .



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Search Strategy:

((Adenosine administration for supraventricular tachycardia) AND With an stopcock) AND Without a stopcock

Search Outcome:

71

Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
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<p>McDowell M. 2019</p>	<p>53 adult patients presenting to the ED with SVT</p>	<p>This is a non randomized single center prospective observational study. Level II evidence.</p>	<ol style="list-style-type: none"> 1. The percentage of patients with successful conversion of SVT to NSR after the first dose of adenosine in SS administration. 2. Achievement of NSR with up to 3 doses of adenosine. 3. Adverse affects secondary to administration technique. 	<p>73% of patients converted to NSR after the first dose in the SS method (95% CI=0.55-0.91) compared to 40.7% in the TS method (95% CI=0.21-0.61)p=0.0176 100% conversion with up to 3 doses of adenosine in the SS method (95% CI= 1.0-1.0) compared to 70% in TS method (95% CI= 0.52-0.89) P=0.0043 0 adverse effects in the SS group compared to 1 extravasation and phlebitis in the TS group.</p>	<p>Limitations of this study include a small sample size, non randomization, pilot data, location of IV not recorded, TS administration technique not recorded and large non inferiority margin.</p> <p>Strength shows real world practice that lends credit to external validation.</p>
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Choi SC. 2003	65 patients in SVT	Non blind randomized prospective study. Level 1 evidence	<ol style="list-style-type: none"> 1. The success rate of conversion from SVT to NSR 2. The average of total dose administered 3. Complications associated with convenient method of adenosine administration 	<p>35 patients studied using the standard method 30 patients studied convenient method Success rate was 80% in the standard group Success rate was 85.7 in convenient group. P= 0.39 Conclusion : the convenient method of combining adenosine with the saline flush is effective and more convenient than the standard administration of adenosine.</p>	<p>Weakness: small sample group Not statistically significant results</p> <p>Strength: this was a randomized trial</p>
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<p>Weberding NT. 2018</p>	<p>Infants less than 10Kg presenting with SVT And infants weighing 10-25kg</p>	<p>in vitro study</p>	<p>To determine if the amount of adenosine delivered through a stopcock for hypothetical patients weighing 2-9kg is lower than the amount delivered for patients weighing 10-25kg. To quantify the dose delivered for weights 2-5, 6-9 and 10-25kg.</p>	<p>The mean dose of adenosine via stopcock increased as weight increased. 2-9Kg had a median dose of 0.08mg/kg 10-25kg had a median dose of 0.1mg/kg 95% CI Median dose delivered was 0.07 mg/kg, 0.09mg/kg and 0.1mg/kg for weights of 2-5kg, 6-9kg and 10-25kg respectively. Conclusion : administration of adenosine via stopcock delivers lower than intended drug dose for patients weighing less than 10 kg due to dead space in the stopcock.</p>	<p>Weakness: In vitro study , therefore clinical application can only be extrapolated from the findings. This study was not blinded. Strength : experiments were repeated in triplicate ad yielded the same results. Observations may apply to other medications of small volume administered through a stopcock.</p>
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Comments: Evidence presented in the above studies supports the use of a single syringe method for administration of adenosine. Conversion rate of SVT to NSR is consistently higher and there are no recorded adverse events. Furthermore , evidence shows that using the stopcock method in infants weighing less than 10Kg delivers a smaller than intended dose of adenosine and has a negative effect on conversion rate with first dose.



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Consider: *the studies presented have limited sample sizes and not all are randomized or present level 1 evidence. While the evidence supports the use of a single syringe method, a more in depth study is required to confirm results.*

Clinical Bottom Line: *the current evidence shows that using a mixed single syringe method to administer adenosine with the flush is AT LEAST as effective as the standard method and no adverse effects have been documented.*

References:

1. Marc McDowell Pharm D, Robert Mokszycki Pharm D, et al. Single Syringe Administration of Diluted Adenosine. 30 October 2019. <https://doi-org.cyber.usask.ca>
2. Sang Cheon Choi, Sang Kyu Yoon, et al. A Convenient method of adenosine administration for Paroxysmal supraventricular tachycardia. *The Korean Society of Emergency Medicine* , Vol 14(3);2003
3. Nathaniel T. Weberding, DO; Richard A. Saladino, MD; et al. Adenosine Administration with a Stopcock Technique Delivers Lower-Than-Intended Drug Doses, *The American College of Emergency Physicians* 2017.

