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Beyond Adenosine: Use of Dexmedetomidine in a New Approach for the Termination of Reentrant Supraventricular Tachycardia

Chrysostomou C., Sanchez de Toledo J., Morell V.O., Wearden P., Wiesen E., Yoshida M., Beerman L., Orr R., Munoz R.
Children's Hospital of Pittsburgh of UPMC, Pittsburgh, USA

Introduction:
Dexmedetomidine an alpha-2 adrenoreceptor agonist has been shown to have potential novel anti-arrhythmic properties. In a recent case-series it was successfully used for the treatment of junctional and atrial tachyarrhythmias for conversion to sinus rhythm (SR) or heart rate control. Adenosine the typical agent for acute cardioversion of reentrant-supraventricular tachycardia (SVT) it's not without limitations. These include ultra-short duration, making it less than ideal with multiple paroxysmal episodes, unpredictable duration of asystole and feeling of impending death, atrial and ventricular fibrillation, and not infrequently ineffectiveness. We present an original approach for the acute cardioversion of reentrant-SVT using dexmedetomidine.

Methods:
Retrospective review of 19 patients admitted to the Cardiac ICU and treated with dexmedetomidine.

Results:
Median age was 10 days (1–827). Ten patients (53%) were postoperative after congenital cardiac surgery. Fourteen (74%) were on baseline antiarrhythmic agents (amiodarone, propranolol, digoxin) and 3 had history of WPW syndrome. Three patients (16%) had received 12 (9-2-1) doses of adenosine prior to dexmedetomidine with successful cardioversion in 8/12 doses (67%). Initial SVT rate was 241 ± 22 bpm. After 0.7 ± 0.3 mcg/kg of dexmedetomidine given at a bolus rate of 1.0 mcg/kg/min (0.3-6.0), cardioversion was achieved in all patients (100%) (Fig). Time to SR was 30 seconds (15-120). Three (16%) had a total of 5 recurrent episodes of reentrant-SVT at 3.2 ± 0.9 hrs apart and were cardioverted with additional dexmedetomidine. None developed prolonged sinus pause, asystole or other arrhythmias. The median sinus pause duration was 0.7 seconds (0.4-1.1). Transient (<3 minutes) hypertension 28 ± 5%, was observed when dexmedetomidine rate was more than 0.7 mcg/kg/min. One episode of hypotension resoled with a one low-dose phenylephrine bolus. Mild to moderate sedation was seen in all patients lasting for 35 minutes (15-60).

Conclusions:
Dexmedetomidine appears to be a safe and effective agent for the acute cardioversion of reentrant-SVT.

Fig.