A COMPARISON OF IV ADENOSINE VS. ORAL DIPYRIDAMOLE IN THALLIUM IMAGING.


We assessed the incidence and severity of hemodynamic changes and side effects (SE) in 108 patients who received thallium imaging with either oral diprydamole (D) (66 pts; mean dose = 488 ± 131 mg) or IV adenosine (A) (42 pts; infusion at 80 ug/kg/min and increased by 20 ug every 2 min. to a maximum of 170 ug). HR increased 9.7 (D) vs. 20 ± 12 (A) beats/min (p < .001). There was a trend toward greater decreases in systolic BP with A: 17 ± 12 (A) vs. 13 ± 10 (D) mmHg (p < .07). SE occurred in 28/66 (42%) with D and in 38/42 (90%) with A (p < .001). The most frequent SE, chest discomfort, flushing, and dyspnea were all more common with A (p < .001). There were no serious side effects with D. 11/42 (26%) with A had SE of note (p < .001): 6 transient 2^ AV block, 2 BP systolic < 80 mmHg, 1 severe bronchospasm, 1 seizure, and 1 chest pain. SBP, and feeling of impending doom (all rapidly reversible). Reversible perfusion defects were seen in 30/66 (45%) in D vs. 28/42 (67%) in A (p < .05). We conclude that at the doses studied IV adenosine, as compared to oral diprydamole, is associated with greater increases in heart rate, more frequent and serious side effects as well as a higher incidence of reversible perfusion defects seen on thallium imaging.

THE EFFECT OF INTRAVENOUS ADENOSINE ON TISSUE PLASMINOGEN ACTIVATOR PHARMACOKINETICS IN MAN

Carlos R. Valdes, David M. Kerins, Donna Howe, Desmond Fitzgerald, Mervyn B. Forman, Vanderbilt University, Nashville, TN.

Intravenous adenosine (ADO) enhances myocardial salvage in experimental models of reperfusion. Since vasodilators may increase liver blood flow, a major determinant of tissue plasminogen activator (t-PA) clearance, their usefulness as adjunctive therapy in acute myocardial infarction in man may be negated. To examine the relationship of ventricular tachycardia (VT) inducibility in 17 patients with inducible sustained monomorphic VT. Patients were studied drug free (DF) and on antiarrhythmic drugs (AAD) therapy (total of 31 drug trials). Strength interval curves were constructed during pacing from right ventricular (RV) apex at a drive cycle length of 500 ms. Extrastimuli of constant pulse width but varying current strengths were used to assess defibrillation. Threshold currents at different coupling intervals were then established. Ventricular conduction time (CT) was measured as the time delay between RV apex and RV outflow tract electrograms. SNC was present when O/Ps of early extrastimuli were more than 2 standard deviations shorter than the mean CT of late coupled extrastimuli. Results: DF 9/31 (29%) vs. AAD 19/31 (61%) (p < .05). SNC generally occurred in association with supernormal excitability as assessed by the strength interval curves. SNC was present in 13/17 patients during drug free state. On AAD therapy, SNC was less frequently observed during effective therapy (4/11) as compared to ineffective therapy (16/20) (p < .02, Chi-Square Analysis). In conclusion, supernormal conduction is an important and previously unreported determinant of ventricular tachycardia inducibility in humans.

RELATION OF SUPERNORMAL CONDUCTION TO VENTRICULAR TACHYCARDIA INDUCIBILITY IN HUMANS

Nipavan Chaimonyovit, Anne M. Gillis, L. Brent Mitchell, D. George Wyse, Henry J. Duff, University of Calgary, Alberta, Canada.

It has been suggested that supernormal conduction (SNC) may play a role in reentrant arrhythmias. We examined the relationship of ventricular SNC to ventricular tachycardia (VT) inducibility in 17 patients with inducible sustained monomorphic VT. Patients were studied drug free (DF) and on antiarrhythmic drugs (AAD) therapy (total of 31 drug trials). Strength interval curves were constructed during pacing from right ventricular (RV) apex at a drive cycle length of 500 ms. Extrastimuli of constant pulse width but varying current strengths were used to assess defibrillation. Threshold currents at different coupling intervals were then established. Ventricular conduction time (CT) was measured as the time delay between RV apex and RV outflow tract electrograms. SNC was present when O/Ps of early extrastimuli were more than 2 standard deviations shorter than the mean CT of late coupled extrastimuli. Results: DF 9/31 (29%) vs. AAD 19/31 (61%) (p < .05). SNC generally occurred in association with supernormal excitability as assessed by the strength interval curves. SNC was present in 13/17 patients during drug free state. On AAD therapy, SNC was less frequently observed during effective therapy (4/11) as compared to ineffective therapy (16/20) (p < .02, Chi-Square Analysis). In conclusion, supernormal conduction is an important and previously unreported determinant of ventricular tachycardia inducibility in humans.

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RELEVANCE OF REVERSE CONDUCTION TO VENTRICULAR TACHYCARDIA IN PATIENTS WITH LEFT VENTRICULAR DYSFUNCTION

James R. Martin, David J. Fisher, Steve M. Collins, William Stanford, University of Iowa, College of Medicine, Iowa City, IA.

Since gated cine computed tomography (CT) of one cardiac cycle has excellent real time spatial resolution, we performed phase analysis of CT images during ventricular tachycardia (VT). Short or long axis CT images were obtained in both sinus rhythm (SR) and VT. Time density curves were derived for each of 120 sites around the endocardium of right and left ventricles. Phase reflecting onset of motion, was calculated for each site by Fourier analysis. The mean phase of left ventricle minus that of right ventricle was the phase delay (delta phase in degrees). Results: ET EF 0°-17° VT EF 0°-17° EF-ET/EF-ET/VT VT Morphology VTI msec

1 31 26° -14° R.B. axis 360
2 29 5° -10° R.B. axis 520
3 9 20° 27° L.B. axis 320
4 0° -20° 27° L.B. axis 800
Abbrev: ET = patient, EF = left ventricular ejection fraction, CT = cycle length, B = bundle. The phase-ET was different from phase-VT in each pt. In VT, phase correlated with DT morphology. However, the site of the earliest phase in either ventricle correlated with the site of origin of VT (electrical activation mapping). In the 3 pts with left ventricular infarcts, the site of earliest phase was adjacent to the infarct even in pt 2 when mean right ventricular phase was earlier than the left during VT with a LB. R axis morphology. Conclusion: Phase analysis of CT images during VT may provide an accurate high resolution activation data noninvasively. The spatial resolution of cine CT may overcome the present temporal resolution of 50 msec per frame.