WORKSHEET for Evidence-Based Review of Science for Emergency Cardiac Care

Worksheet author(s)
Steven Kronick MD MS

Date Submitted for review:
January 23, 2010

Clinical question.

In adult patients with undifferentiated stable wide complex tachycardia (prehospital and in-hospital) (P), does the use of any drug or combination of drugs (I) compared with not using drugs (or a standard drug regimen) (C), improve outcomes (eg. reversion rates)(O)?

Is this question addressing an intervention/therapy, prognosis or diagnosis?
Intervention/Therapy

State if this is a proposed new topic or revision of existing worksheet:
New Topic

Conflict of interest specific to this question
Do any of the authors listed above have conflict of interest disclosures relevant to this worksheet? No

Search strategy (including electronic databases searched).

Wide complex tachycardia .mp. [mp=ti, ot, ab, nm, hw, ui, tx, kw, ct, sw, rw, tn, pt, an] 590

and

therapy.mp [mp=ti, ot, ab, nm, hw, ui, tx, kw, ct, sw, rw, tn, pt, an] 2356464

yielded

240 references

Databases searched: Ovid MEDLINE, Ovid MEDLINE(in Process), Ovid OLD MEDLINE, ACP Journal Club, CCTR, CDSR, DARE, CLCMR, CLHTA, CLEED, IPAB, Journals@OVID, AVOL, EMBASE, Index to Foreign Legal Periodicals and Transport Database.

All 240 references were hand searched yielding 12.

The Bibliographies of these 12 citations were searched and each additional citation was searched to yield 11 studies

Bibliographies of all review articles were also searched and as an attached list.

• State inclusion and exclusion criteria

Adult patients patients included, pediatrics excluded. Review articles excluded.

• Number of articles/sources meeting criteria for further review: 11

Wide complex tachycardia .mp. [mp=ti, ot, ab, nm, hw, ui, tx, kw, ct, sw, rw, tn, pt, an] 590

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### Summary of evidence

#### Evidence Supporting Clinical Question – All Adenosine (all outcome E)

<table>
<thead>
<tr>
<th>Level of evidence</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
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<tbody>
<tr>
<td>Marill 2009, 2512</td>
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<td>Domanovits 1994, 589</td>
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<td>Ilkhanipour 1993, 1360</td>
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<td>Rankin 1989, 195</td>
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<td>Wilber 1993, 126</td>
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#### Level of evidence

A = Return of spontaneous circulation  
B = Survival of event  
C = Survival to hospital discharge  
D = Intact neurological survival  
E = Reversion to sinus rhythm  
**Italics** = Animal studies

#### Evidence Neutral to Clinical question

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#### Level of evidence

A = Return of spontaneous circulation  
B = Survival of event  
C = Survival to hospital discharge  
D = Intact neurological survival  
E = Other endpoint  
**Italics** = Animal studies
## Evidence Opposing Clinical Question

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- Armengol 1989, 254 (lidocaine in VT) E
- Buxton 1987, 1107 (verapamil in VT) F
- Exner 1995, 351 (adenosine in WPW) F
- Gupta 2002, 477 (adenosine in WPW) F
- Parham 2001, 71 (adenosine in VT) F
- Shah 2001.0208 (adenosine in WPW) F

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**Level of evidence**

- A = Return of spontaneous circulation
- B = Survival of event
- C = Survival to hospital discharge
- D = Intact neurological survival
- E = Reversion to sinus rhythm
- F = Tachydysrhythmia
Alternate worksheets address the therapy of supraventricular tachycardia (ALS D 18), monomorphic ventricular tachycardia (ALS D 19), and polymorphic ventricular tachycardia (ALS D 20). It can, however, be difficult to identify the rhythm of the patient who presents with a wide complex tachycardia that is not differentiated. It is likely to be one of three rhythms: supraventricular tachycardia with aberrancy, ventricular tachycardia or a pre-excited rhythm.

If the underlying rhythm can be determined with reasonable accuracy then it is prudent to treat the rhythm based on the recommendations for that rhythm. This worksheet sought to identify management of patients with a wide complex tachycardia for whom the rhythm is not determined or known.

All the evidence is based on case reports alone.

The largest case series (Marill 2009, 2512) reported 197 patients who presented to the Emergency Department with wide QRS complex tachycardia. Adenosine converted 106 of these patients to sinus rhythm. Only 2 of whom converted were later found to have ventricular tachycardia as the cause of their wide complex tachycardia, but no patients in either group had any primary adverse events.

There are case reports showing detrimental effects of verapamil in patients with ventricular tachycardia (Buxton 1987, 1107), in patients with Wolf-Parkinson-White Syndrome given adenosine (Exner 1995, 351 showed afib with RVR and VF, Gupta 2002, 477 showed VF and Shah 2001, 208 showed VF in patients with WPW treated with adenosine), but these isolated case reports cannot reflect the true extent of real risk.

A reasonable approach to the patient with undifferentiated stable wide complex tachycardia is treat them with adenosine and if there is no response as the vast majority of patients with wide complex tachycardia are later determined to have ventricular tachycardia as the rhythm, to follow the treatment algorithm for ventricular tachycardia.

Acknowledgements:
Citations with notes

Armengol 1989, 254


Lidocaine Oppose LOE 4 poor: 31 episodes of WCT in 20 patients treated with lidocaine. WCT terminated in only 6/31 episodes and 5/20 patients and in 3 of these 5 patients recurrent WCT failed to respond to lidocaine.

Buxton 1987, 1107


Oppose Verapamil LOE 4 poor: 44% (11/25) patients with known VT developed severe hypotension. Although this was known to be VT not an undifferentiated WCT, concern is raised for using verapamil in those patients with WCT not known to be VT.

Domanovits 1994, 589


Support Adenosine LOE 4 fair: 59% of patients with WCT converted to sinus rhythm after a mean dose of 21 +/- 10 mg of adenosine after vagal maneuvers failed. 20% of all patients experienced side effects that did not require therapy.

Exner 1995, 351


Oppose adenosine in WPW, LOE 4 poor: case report of 2 patients with known WPW developed complications after standard dose of adenosine. One developed atrial fibrillation with RVR requiring electrical cardioversion and the second developed ventricular fibrillation requiring defibrillation. Both did well.

Gupta 2002, 477


Oppose Adenosine LOE 4 poor: a control group of patients with orthodromic tachycardia is reported, but this study realistically represents a case report of 9 patients with preexcited AF all of whom were treated with adenosine. Four patients developed ventricular fibrillation.

Ilkhanipour 1993, 1360

Support Adenosine LOE 4 poor: case report of 2 patients who presented with WCT who responded to adenosine but were later found to have WPW.

**Marill 2009, 2512**


Support Adenosine LOE 4 good: 197 patients with WCT. 116 later found to have SVT and 81 found to have VT. 90% of patients later found to have SVT converted to sinus rhythm and 2 of 81 patients later found to have VT converted. Response to adenosine was found to be highly predictive for SVT. No patients in either group had any primary adverse events.

**Parham 2001, 71**


Oppose Adenosine LOE 4 poor: case report of a single patient who presented with WCT later found to be VT who developed VF after administration of adenosine.

**Rankin 1989, 195**


Support Adenosine LOE 4 poor: 24 patients with WCT all treated with adenosine. Rhythm terminated in 6 and helped reveal rhythm in 4. Adenosine was 90% sensitive, 93% specific for identifying SVT and had a 92% predictive accuracy.

**Shah 2001, 208**


Oppose adenosine in WPW LOE 4 poor: two patients with known preexcited atrial fibrillation given adenosine and developed ventricular fibrillation.

**Wilber 1993, 126**

Support Adenosine LOE 4 poor: select group of 7 of 14 patients with known VT that responded with termination of rhythm with adenosine.

Citation List


Review Papers


