Towards evidence based emergency medicine: best BETs from the Manchester Royal Infirmary

Edited by K Mackway-Jones

Amiodarone or flecainide for cardioversion in acute onset atrial fibrillation

Report by Jon Argall, Senior Clinical Fellow

Checked by Ian Crawford, Clinical Research Fellow

A short cut review was carried out to establish whether amiodarone is better than flecainide at restoring sinus rhythm in patients with atrial fibrillation. Altogether 42 papers were found using the reported search, of which four presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. A clinical bottom line is stated.

Clinical scenario

A 50 year old woman presents to the emergency department with acute onset of palpitations of less than two hours duration. She does not have chest pain, her heart rate is about 140–160 with a good systolic blood pressure, and respiratory examination is normal. An ECG confirms the rhythm to be atrial fibrillation. You consider which method of pharmacological cardioversion would be most suitable as the medical and cardiological opinions differ between amiodarone and flecainide.

Three part question

In [acute onset atrial fibrillation] is [amiodarone better than flecainide] at [restoring normal sinus rhythm]?

Search strategy


Search outcome

Altogether 42 papers were found of which four were directly relevant to the three part question (see table 1).

Comment(s)

There were no significant differences in the patient groups or adverse effects in all studies. Most adverse effects were mild and self limiting, with no fatal events reported.

Amiodarone or flecainide for cardioversion in acute onset atrial fibrillation

Amiodarone is more efficacious than flecainide in restoring sinus rhythm.

The sensitivity of a normal chest radiograph in ruling out aortic dissection

Report by Kerstin Hogg, Clinical Research Fellow

Checked by Stewart Teece, Clinical Research Fellow

A short cut review was carried out to establish the sensitivity of a normal chest radiograph as a rule out test for aortic dissection.
aneurysm. Altogether 557 papers were found using the reported search, of which four presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. A clinical bottom line is stated.

Clinical scenario
A 52 year old man attends the emergency department with central chest tightness and left arm heaviness. ECG shows anterior ST elevation of 3 mm in three consecutive leads. He has a normal mediastinum on chest radiograph, but as you administer the thrombolytic agent, you wonder just how sensitive this investigation is in ruling out an aortic dissection.

Three part question
In a [patient with chest pain] what is the [sensitivity of a normal chest radiograph] in ruling out [aortic dissection]?

Search strategy

Search outcome
Altogether 557 papers were found. One recent literature review included the relevant papers with the exception of three additional papers (see table 2).

Comment(s)
All these studies are of poor quality. There is an enormous lack of quality prospective studies recruiting consecutive patients presenting to the emergency department with chest pain.

► CLINICAL BOTTOM LINE
The classic chest radiological findings of a wide mediastinum or abnormal aortic contour do not seem sufficiently sensitive to rule out aortic dissection in a patient with chest pain.

Antibiotics in acute exacerbations of chronic obstructive pulmonary disease

Report by Ross Murphy, Specialist Registrar
Checked by Martin McKechnie, Specialist Registrar, Joel Dunning, RCS Fellow

Table 1

<table>
<thead>
<tr>
<th>Author, date and country</th>
<th>Patient group</th>
<th>Study type (level of evidence)</th>
<th>Key results</th>
<th>Outcomes</th>
<th>Study weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capucci A et al, 1992, Italy</td>
<td>62 patients with recent onset atrial fibrillation (&lt;7 days), placebo versus amiodarone iv bolus followed by infusion or flecainide po</td>
<td>Randomised single blind trial</td>
<td>Conversion to sinus rhythm as a percentage</td>
<td>Placebo group discontinued monitoring after 8 hours</td>
<td>Small numbers</td>
</tr>
<tr>
<td>Donovan KD et al, 1995, Australia</td>
<td>98 patients with acute onset atrial fibrillation (&lt;72 h), placebo versus amiodarone iv or flecainide iv</td>
<td>RCT</td>
<td>Conversion to sinus rhythm as a percentage</td>
<td>Placebo 18/32, amiodarone 19/32, flecainide 23/34</td>
<td>Power not shown</td>
</tr>
<tr>
<td>Boriani G et al, 1998, Italy</td>
<td>417 patients with recent onset atrial fibrillation (&lt;7 days), placebo versus amiodarone iv, flecainide po, propafenone iv or propafenone po</td>
<td>Cohort</td>
<td>Conversion to sinus rhythm as a percentage</td>
<td>Placebo 9, amiodarone 6, flecainide 13</td>
<td>Power not shown</td>
</tr>
<tr>
<td>Martinez-Marcos FJ et al, 2000, Spain</td>
<td>150 patients with acute onset atrial fibrillation (&lt;48 hrs), Amiodarone iv versus flecainide iv or propafenone iv</td>
<td>Randomised single blind trial</td>
<td>Conversion to sinus rhythm as a percentage</td>
<td>Placebo 9, amiodarone 14, flecainide 29</td>
<td>Power not shown</td>
</tr>
</tbody>
</table>
A short cut review was carried out to establish whether antibiotics improve recovery in patients with acute exacerbations of COPD. Altogether 200 papers were found using the reported search, of which four presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. A clinical bottom line is stated.

**Clinical scenario**

A 78 year old man with a history of COPD attends the emergency department with a recent increase in shortness of breath, cough, and wheeze. You diagnose him as suffering from an exacerbation of COPD and treat him with oxygen, nebulised salbutamol, and corticosteroids. You wonder if a course of antibiotics would also be of benefit.

**Search strategy**

Medline 1966-11/03 using the Ovid interface. In addition the Cochrane Database of Systematic Reviews was searched and the National Institute of Clinical Excellence web site was searched for relevant guidelines.
exp hospitals, chronic disease OR chronic.mp) AND (exp lung disease, obstructive OR obstructive.mp) OR exp emphysema OR exp pulmonary emphysema OR emphysema.mp OR exp bronchitis OR bronchitis.mp OR exp COPD.mp OR COAD.mp OR airway obstruction.mp] AND [exp acute disease OR acute.mp OR exacerbation.mp] AND [exp antibiotics OR antibiotic$.mp] AND [exp Meta-analysis OR meta-analysis.mp OR exp review literature OR Review.mp OR systematic review.mp OR guideline$.mp OR exp clinical protocol OR protocol.mp]

### Table 3

<table>
<thead>
<tr>
<th>Author, date and country</th>
<th>Patient group</th>
<th>Study type (level of evidence)</th>
<th>Outcomes</th>
<th>Key results</th>
<th>Study weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saint S et al, 1995, USA</td>
<td>9 randomised trials (n = 1101) including inpatients and outpatients with exacerbations of COPD</td>
<td>Meta-analysis</td>
<td>Mortality benefit of antibiotics v placebo, (effect size transformed into units of standard deviation)</td>
<td>0.22 (95% CI 0.10 to 0.34)</td>
<td>English language search only</td>
</tr>
<tr>
<td>British Thoracic Society 1997</td>
<td>Initiated by the Standards of Care Committee of the British Society. A core group of individuals produced background papers that were collated into a single document. This was discussed over a two day period by a larger group which included respiratory physicians from both teaching and teaching and district general hospitals across the UK, geriatricians, general practitioners, nurses, and public health physicians</td>
<td>Systematic review and guideline</td>
<td>Situations in which antibiotics are proven to be of use in hospital and non-hospital settings</td>
<td>10.75 l/min (95% CI, 4.96 to 16.54l/min) (6 trials 836 patients)</td>
<td>Variety of antibiotics combined to produce these figures</td>
</tr>
<tr>
<td>Mcrory DC et al, 2001</td>
<td>Systematic review conducted by a joint panel from the American College of Physicians (ACP)-American Society for Internal Medicine (ASIM) and the American College of Chest Physicians (ACCP)</td>
<td>Systematic review</td>
<td>Findings from 11 RCTs looking at antibiotics v placebo (They found two additional papers to the meta-analysis of Saint et al)</td>
<td>Three papers found a statistical benefit, 3 papers found a non-significant benefit and the remainder showed no benefit.</td>
<td>Paper search strategy may not have been systematic, search methods not fully described</td>
</tr>
<tr>
<td>NICE 2003</td>
<td>Full NICE guideline for the management of patients with COPD</td>
<td>Systematic review</td>
<td>Grade A recommendations</td>
<td>Antibiotics should be used to treat exacerbations of COPD associated with a history of purulent sputum</td>
<td>Study effects were not summarised by meta-analysis</td>
</tr>
<tr>
<td></td>
<td>Note: currently only in its 2nd draft. 270 received antibiotics, 92 did not.</td>
<td>Grade B recommendations</td>
<td>Benefits were larger, the more severe the exacerbation Days of administration ranged from 3 to 10 days in these studies</td>
<td>Antibiotics are more likely to be helpful in patients with more severe underlying disease Patients with exacerbations without purulent sputum do not need antibiotic therapy unless there is consolidation on a chest radiograph or clinical signs of pneumonia</td>
<td></td>
</tr>
</tbody>
</table>

Duration of treatment
- (1) increased breathlessness
- (2) increased sputum volume
- (3) development of purulent sputum

Antibiotic of choice
- Any patient with pH<7.35 should also receive antibiotics
- A maximum of 7 days should always be sufficient
- Oral treatment with common antibiotics such as amoxicillin or tetracycline should be considered first choice

Number of days of administration
- Benefits were larger, the more severe the exacerbation
- Days of administration ranged from 3 to 10 days in these studies

Note: currently only in its 2nd draft. 270 received antibiotics, 92 did not.
Intravenous magnesium in chronic obstructive pulmonary disease

Report by Rachel Jenner, Specialist Registrar
Checked by Richard Body, Senior House Officer

A short cut review was carried out to establish whether the addition of intravenous magnesium to standard treatments improved outcome in patients with exacerbations of COPD. Altogether 465 papers were found using the reported search, of which one presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of this best paper are tabulated. A clinical bottom line is stated.

Clinical scenario
A 65 year old man presents to the emergency department with an exacerbation of COPD. You are aware that intravenous magnesium is used as a bronchodilator in acute severe asthma and wonder if it would benefit this patient.

Three part question
In [patients with an exacerbation of COPD] does [the addition of intravenous magnesium to conventional treatments] improve [PEFR or discharge rate or morbidity or mortality]?

Search strategy
Medline 1966-11/03 using the Ovid interface, including non-indexed citations and Medline in progress. [exp Magnesium or magnesium.mp] AND [exp Pulmonary Disease, Chronic Obstructive OR COPD.mp OR COAD.mp OR exp Lung Diseases] LIMIT to human AND English

Search outcome
Altogether 465 papers were found of which one was relevant (see table 4).

Comment(s)
There is only one small study addressing this question and it excludes patients with acute infection, which is one of the commonest causes of exacerbation of COPD. However, it does show a small significant improvement in PEFR with intravenous magnesium. The clinical significance of this change may be small but seems to show a non-significant trend towards a reduced rate of admission. A larger trial including patients with signs of acute infection would be helpful.

► Clinical bottom line
Intravenous magnesium is worth considering in patients with an exacerbation of COPD.


Table 4

<table>
<thead>
<tr>
<th>Author, date and country</th>
<th>Patient group</th>
<th>Study type (level of evidence)</th>
<th>Outcome</th>
<th>Key results</th>
<th>Study weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skorodin MS et al, 1995, USA</td>
<td>72 adults (70 male) presenting to ED with exacerbation COPD randomised to 1.2 g magnesium sulphate or placebo after receiving 2.5 mg nebulised salbutamol</td>
<td>Double blinded PRCT</td>
<td>Change in PEFR at 30 min and 45 min</td>
<td>25.1 l/min better for MgSO4 at 30 min, 7.1 l/min better for MgSO4 at 45 min (p = 0.03)</td>
<td>Male bias</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Change in % PEFR at 30 min and 45 min</td>
<td>22.4% for MgSO4 at 30 min, 6.1% at 45 min (p = 0.01)</td>
<td>Patients with high temperature or radiological signs of infection excluded</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Need for hospitalisation</td>
<td>28.1% for MgSO4 group v 41.9% for placebo (p = 0.25)</td>
<td>Three patients received 3 g magnesium sulphate instead of 1.2 g</td>
</tr>
</tbody>
</table>
Intra-articular corticosteroid injections in acute rheumatoid monoarthritides

Report by Jane Sholsberg, Medical Student
Checked by Rupert Jackson, Consultant

A short cut review was carried out to establish whether intra-articular corticosteroid injections were effective at reducing pain in patients with acute rheumatoid monoarthritis. Altogether 215 papers were found using the reported search, of which one presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of this best paper are tabulated. A clinical bottom line is stated.

Clinical scenario
A 42 year old woman known to suffer from rheumatoid arthritis presents to the emergency department with an acutely inflammed swollen knee. You know this is a standard treatment but wonder how effective it actually is.

Three part question
In [patients with acute rheumatoid monoarthritis] are [intra-articular corticosteroid injections] effective in [reducing pain and swelling and improving mobility]?

Search strategy
Medline 1966-11/03 using the Ovid interface, including Medline in progress and non-indexed citations. (exp arthritis, rheumatoid/OR monoarthritis.mp. OR exp arthritis OR exp rheumatic diseases/OR monoarthropathy.mp.) AND (exp steroids/or steroids.mp. OR exp methylprednisolone/OR methylprednisolone.mp OR exp hydrocortisone/OR hydrocortisone.mp OR exp prednisolone/OR prednisolone.mp) AND (exp injections, intra-articular/) LIMIT to human AND English AND abstracts.

Search outcome
Altogether 215 papers found of which 214 were irrelevant or of insufficient quality. The remaining paper is shown in table 5.

Comment(s)
Acute rheumatoid monoarthritides are commonly treated with intra-articular corticosteroid injections. Although this paper indicates a favourable outcome using intra-articular rimexolone injections particularly at 40 mg, the small number used in each group may have introduced bias and the high drop out rate in the placebo group in the later stages of the study prevents efficacious comparisons to be made.

► CLINICAL BOTTOM LINE
The available evidence suggests that a single intra-articular injection of 40 mg rimexolone significantly reduces pain, tenderness and stiffness, and improves mobility in patients with acute rheumatoid arthritis.