Best evidence topic reports (BETs) summarise the evidence pertaining to particular clinical questions. They are not systematic reviews, but rather contain the best (highest level) evidence that can be practically obtained by busy practicing clinicians. The search strategies used to find the best evidence are reported in detail in order to allow clinicians to update searches whenever necessary. The BETs published below were first reported at the Critical Appraisal Journal Club at the Manchester Royal Infirmary and placed on the BestBETs web site. Each BET has been constructed in the four stages that have been described elsewhere. The BETs shown here together with those published previously and those currently under construction can be seen at http://www.bestbets.org.

Eight BETs are included in this issue of the journal.

- Swimmers view or supine oblique views to visualise the cervicothoracic junction
- Computed tomography and the exclusion of upper cervical spine injury in trauma patients with altered mental state
- Antibiotics in compound depressed skull fractures
- Antibiotics in patients with isolated chest trauma requiring chest drains
- Lignocaine (lidocaine) premedication before rapid sequence induction in head injuries
- Ultrasound or computed tomography in paediatric blunt abdominal trauma
- Routine use of antibiotic ointment and wound healing
- Factor VIIa for intractable blood loss in trauma

Swimmers view or supine oblique views to visualise the cervicothoracic junction

Report by Nasreen Contractor, Specialist Registrar

Checked by Martin Thomas, Specialist Registrar

Abstract

A short cut review was carried out to establish whether swimmer’s views were better than superior oblique views at visualising the C7/T1 junction. Eleven 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 36 year old man is brought to the emergency department after a road traffic accident. He complains of neck pain. A “pulled” lateral is taken, but fails to show the C7/T1 junction. You wonder whether a pair of supine oblique views or a swimmer’s view would be best to visualise this region.

Three part question

In a [trauma patient in whom standard lateral views of the cervical spine are inadequate] is a [swimmer’s view better than supine oblique views] at [visualising the C7/T1 junction]?

Search strategy

Medline 1966- 07/02 using the OVID interface. [supine oblique.mp OR trauma oblique.mp OR swimmers view.mp OR twining.mp] AND [exp X-Rays OR x-ray$.mp or radiograph.mp OR exp radiography OR radiography.mp] AND [exp cervical vertebrae OR cervical spine.mp OR exp neck injuries OR neck injur$.mp OR cervicothoracic junction.mp.] LIMIT to human AND English.

Search outcome

Altogether 11 papers were found of which only one was relevant to the original question (see table 1).

Table 1

<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>Ireland AJ et al, 1998, UK</td>
<td>427 consecutive patients who attended with acute trauma requiring cervical spine radiographs. 60 patients required additional swimmers view. 62 required additional paired supine oblique views.</td>
<td>Two phase prospective study</td>
<td>Able to visualise the vertebral bodies and posterior elements of the cervicothoracic junction</td>
<td>37% of the swimmers group and 38% of the supine oblique group were judged satisfactory. When vertebral bodies not shown adequately, 70% of supine obliques and 37% swimmers showed posterior elements adequately</td>
<td>9 patients from supine oblique group lost, therefore not included in calculations</td>
</tr>
</tbody>
</table>
Computed tomography and the exclusion of upper cervical spine injury in trauma patients with altered mental state

Report by Martin Thomas, Specialist Registrar

Checked by Stewart Teece, Clinical Research Fellow

Abstract
A short cut review was carried out to establish whether CT scans of the upper cervical spine are necessary in trauma patients with altered mental status and normal plain radiographs. A total of 572 papers were found using the reported search, of which six 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 20 year old man is brought into the emergency department having been hit by a high speed vehicle while crossing the road. He has a large haematoma to the head and is confused and combative. Plain radiographs of his cervical spine are normal, as are radiographs of his chest and pelvis. You request a CT brain scan and a CT of his upper cervical spine, as you have heard that plain radiographs can miss injuries in this area. The radiologist does not agree that this is indicated as the plain radiographs of the cervical spine appear normal. You wonder if there is any evidence to support your request.

Three part question
In [trauma patients with altered mental status] is [plain radiography as good as CT] at [diagnosing significant upper cervical spine injuries]?

Table 2

<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>Kirshenbaum KJ, et al 1990, USA</td>
<td>50 consecutive patients with significant head trauma CT v radiography.</td>
<td>Prospective case series.</td>
<td>Number of patients with significant upper cervical spine fractures</td>
<td>4 v 0</td>
<td>Sensitivity of CT not assessed</td>
</tr>
<tr>
<td>Woodring JH and Lee C, 1993, USA</td>
<td>216 consecutive patients with acute traumatic fractures, subluxations or dislocations of cervical vertebrae. CT of entire cervical spine and plain films performed on all patients</td>
<td>Retrospective case series.</td>
<td>Fractures seen at time on plain film trauma series</td>
<td>39%</td>
<td>Retrospective nature of study</td>
</tr>
<tr>
<td>Link TM et al, 1995, Germany</td>
<td>202 patients with head injuries and GCS&lt;7 37 (18.3% of patients) had fractures of occipital condyles, C1 or C2</td>
<td>Prospective consecutive series.</td>
<td>Number of fractures of C1 or C2 identified by CT or radiography</td>
<td>28 (13.9% of patients) 17 (60.7% of those identified by CT) 8 minutes</td>
<td>Wide age range (3-86)</td>
</tr>
<tr>
<td>Ajani AE et al, 1998, Australia</td>
<td>91 major trauma patients with injuries to head or neck, or multiple injuries. 12 with abnormal or equivocal radiographs had CT scans. 48 unconscious or uncooperative with normal radiographs had passive flexion-extension views</td>
<td>Prospective consecutive case series.</td>
<td>Total patients identified with unstable cervical injury</td>
<td>6 (6.6%)</td>
<td>CT not uniformly performed - possible that significant number of false negative radiographs missed.</td>
</tr>
<tr>
<td>Berne JD et al, 1999, USA</td>
<td>58 high risk blunt trauma patients, with inability to evaluate cervical spine clinically. ICU. All patients underwent plain lateral and AP +/- odontoid view when possible in non-intubated patients, and subsequent complete cervical helical CT (C0 to T1) CT v radiography</td>
<td>Prospective consecutive case series.</td>
<td>Number of patients with unstable injuries</td>
<td>8 (13.8%)</td>
<td>Radiographic protocol violations in 9 patients of original 67 meeting criteria</td>
</tr>
<tr>
<td>Schenarts PJ et al, 2001, USA</td>
<td>1356 blunt trauma patients, aged over 14, with altered mental status (mean GCS 11) requiring CT evaluation of 2 or more body systems. CT of C0-C3, in addition to five view plain film series, CT v radiography</td>
<td>Prospective consecutive case series.</td>
<td>Number of patients in whom cervical spine injuries identified overall</td>
<td>70 (5.2% of all eligible patients) 67 v 38</td>
<td>Unblindered radiological review Haemodynamically unstable patients, those dying before plain films, those requiring immediate surgery excluded</td>
</tr>
</tbody>
</table>
Antibiotics in compound depressed skull fractures

Report by Baha Ali, Senior Clinical Fellow
Checked by Angaj Ghosh, Senior Clinical Fellow

Abstract

A short cut review was carried out to establish whether antibiotics reduce the incidence of meningitis in patients with compound depressed skull fracture. Altogether 198 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 23 year old man attends the emergency department having been assaulted outside a nightclub with a hammer. He has sustained an isolated head injury with no loss of consciousness and is fully alert and oriented. He has a compound depressed left parietal skull fracture (confirm and defined by CT scan). No surgical intervention is considered. You wonder whether the administration of antibiotics will reduce the chance of meningitis developing.

Three part question

In [an adult with compound depressed skull fracture] does [the administration of antibiotics] reduce [the incidence of meningitis]?

Search strategy

Medline 1996–07/02 using the OVID interface. [(exp skull fractures OR skull fracture$).mp] OR ((exp fractures, open OR compound fracture$.mp OR depressed fracture$.mp) AND (exp skull OR skull$.mp OR cranium$.mp OR calvarium$.mp)) AND (exp antibiotics OR antibiotic$.mp OR exp antibiotic$.mp).
penicillin OR penicillln$ OR benzylpenicillin.mp OR exp metronidazole OR metronidazole.mp OR flagyl.mp ] LIMIT to human AND English language.

**Search outcome**
Altogether 198 papers were found, 197 of which were irrelevant or of insufficient quality. The remaining paper is shown in table 3.

**Comment(s)**
The incidence of infectious complications other than meningitis in the non-antibiotic group was higher than in the group given antibiotics.

▲ **CLINICAL BOTTOM LINE**
The results of this study do not provide a definitive answer regarding the role of antibiotics in preventing meningitis. There is very little evidence about giving antibiotic in depressed compound skull fracture. Local advice should be followed.


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**Antibiotics in patients with isolated chest trauma requiring chest drains**

Report by John Butler, Specialist Registrar
Check by Ian Sammy, Consultant, and Joel Desmond, Research Fellow

**Abstract**
A short cut review was carried out to establish whether the administration of antibiotics reduces the incidence of intra-thoracic infection in patients who have had a chest drain inserted after trauma. Altogether 321 papers were found using the reported search, of which two 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 25 year old man is stabbed in the chest during a pub brawl. He sustains an isolated chest injury that requires a tube thoracostomy. You wonder whether the administration of prophylactic antibiotics will reduce the incidence of intrathoracic infection in this patient.

**Three part question**
In [patients suffering isolated penetrating chest injuries which require tube thoracostomy] does [the administration of prophylactic antibiotics] reduce [the incidence of intrathoracic infection]?

**Search strategy**
Medline 1966 to 8/02 using the OVID interface. ( [exp thoracic injuries OR chest injury.mp OR exp Chest tubes OR exp Thoracostomy OR chest drain.mp OR chest tube$.mp OR thoracostomy.mp ] AND [exp antibiotic prophylaxis OR antibiotic prophylaxis.mp OR exp antibiotics OR antibiotics.mp OR prophylactic antibiotics.mp]) LIMIT to human AND English.

**Search outcome**
Altogether 321 papers were found, of which 308 were irrelevant. One paper was a systematic review of 11 other relevant papers up to 1997 that were also found on our search. Only one other relevant paper was found after this date. Therefore the systematic review and the remaining paper are included in table 4.

**Comment(s)**
The EAST Practice Management Group have recently performed an excellent quality systematic review on this subject that included all other studies except Gonzalez et al. They give figures that show that the number needed to treat with antibiotics to prevent an intrathoracic infection is six. They caution that the available studies are small and these studies look at chest drains inserted under differing clinical situations and by differing grades of clinicians.

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### Table 4

<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>Gonzalez RP and Holevar MK, 1998, USA</td>
<td>139 patients with isolated chest injuries either blunt (34) or penetrating (105) with ISS scores of 9 or 10 requiring tube thoracostomy.</td>
<td>Double blind PRCT</td>
<td>Empyema/pneumonia</td>
<td>Antibiotic group - No infection v placebo group - 2 empyemas, 2 pneumonias. Fisher’s exact test p=0.05</td>
<td>Sample size not justified Small number of positive cases in the placebo group.</td>
</tr>
<tr>
<td>Luchette FA et al for EAST practise management guidelines work group, 2000, USA</td>
<td>4 double blinded PRCTs, 5 PRCTs and 2 meta-analyses Search methodology . Medline search 1977-1997 using chest tubes, human, drainage, tube thoracostomy, infection, empyema, bacterial infection prevention and control. (this identified 44 references of relevance) bibliographies of identified references were searched. Articles reviewed by 5 trauma surgeons, 2 pharmacists and a health care economist.</td>
<td>Meta-analysis</td>
<td>Pneumonia</td>
<td>Antibiotic group 4.1% [14/338] Placebo group 14% [49/332] p&lt;0.001 Antibiotic group 0.6% [2/338] Placebo group 8.7% [29/332] p&lt;0.0001 Antibiotic group 5.0% [17/338] Placebo group 23.2% [77/332] p&lt;0.0001 (note ?small adding up error in total figures published by journal)</td>
<td>This well conducted systematic review pointed out that of the 9 primary studies found, Demetriades et al gave a single dose of antibiotics to all pts before randomisation thus they excluded it from further pooled results. Of the 8 other studies, only 4 were double blinded and only 3 had applied Center for Disease Control criteria for pneumonia and Empyema. Despite the weaknesses in the evidence the EAST group recommends that there is sufficient class 1 and 2 evidence to recommend 24 hours of a first generation cephalosporin.</td>
</tr>
</tbody>
</table>

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Lignocaine premedication before rapid sequence induction in head injuries

Report by John Butler, Specialist Registrar
Checked by Rupert Jackson, Specialist Registrar

Abstract
A short cut review was carried out to establish whether pretreatment with lignocaine (lidocaine) reduces the rise in intracranial pressure associated with intubation of head injured patients. Altogether 85 papers were found using the reported search, of which six 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 patient attends the emergency department having sustained a blunt head injury. On examination they have clinical signs of raised intracranial pressure and a Glasgow Coma Score of 5. You decide that the patient needs a rapid sequence intubation and continuous mandatory ventilation to protect the airway and reduce intracranial pressure. You wonder whether the pretreatment with lignocaine will attenuate the rise in intracranial pressure from the rapid sequence intubation.

Three part question
In [head injured patients with signs of raised intracranial pressure who need RSI and ventilation] is [pretreatment with lignocaine better than placebo] at [attenuating the rise in intracranial pressure associated with RSI]?

Search strategy
Medline and Embase 1966–07/02 using the OVID interface. [exp Intracranial pressure OR intracranial pressure.mp OR ICP.mp] LIMIT to human AND English AND remove duplicates.

Table 5

<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>Donegan MF et al, 1980, USA</td>
<td>10 ventilated comatose patients on ICU / IV lignocaine 1.5 mg/kg v N/Saline</td>
<td>Double blind PRCT</td>
<td>Change in ICP on suctioning</td>
<td>Lignocaine attenuated rise in ICP</td>
<td>Small numbers, Patients not paralysed</td>
</tr>
<tr>
<td>White PF et al, 1982, USA</td>
<td>15 comatose patients with diffuse axonal injury on ICU</td>
<td>RCT</td>
<td>Change in baseline ICP</td>
<td>Reduced with lignocaine and thiopentone</td>
<td>Small numbers, Unblinded, Questionable randomisation</td>
</tr>
<tr>
<td>Yano M et al, 1986, USA</td>
<td>9 patients with severe head injury (GCS&lt;8); All patients had mild cranial High BP. All ventilated</td>
<td>RCT compared response on suctioning. IV lignocaine v intratracheal lignocaine. Readings at 1, 3, 5, 10, 15 min</td>
<td>Change in baseline ICP</td>
<td>No change in baseline ICP</td>
<td>Unblinded</td>
</tr>
</tbody>
</table>

CLINICAL BOTTOM LINE
Administration of prophylactic antibiotics to patients requiring chest tube thoracostomy for isolated chest injuries reduces the incidence of intrathoracic infection especially empyema with an number needed to treat of six. The ideal regimen is 24 hours of a first generation cephalosporin.


Ultrasound or computed tomography in paediatric blunt abdominal trauma

Report by Ross Murphy, Senior Clinical Fellow
Checked by Angaj Ghosh, Senior Clinical Fellow

Abstract
A short cut review was carried out to establish whether computed tomography is superior to ultrasonography at identifying intra-abdominal injury in children. Altogether 123 papers were found using the reported search, of which six 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 6 year old boy presents to the emergency department after falling out of a fast moving car. He is extremely distressed and appears to have sustained multiple injuries including a large laceration to his head, bruising and deformity to both forearms and his left lower leg. After initial assessment and stabilisation you decide to paralyse, intubate, and ventilate him before performing a head CT. However you are also concerned about the possibility of an intra-abdominal injury. You wonder whether an ultrasound or CT would be better at identifying this.

Three part question
In [a paediatric patient with blunt abdominal trauma] is [an ultrasound scan] better at identifying intra-abdominal injury than [a CT scan]?

Search strategy
Medline 1966–07/02 using the OVID interface. [exp abdominal injuries OR “abdominal injur$” .mp OR “abdominal trauma$” .mp] AND [exp tomography, x-ray computed OR “computed tomograph$” .mp OR “computerised tomograph$” .mp OR CT.mp] AND [exp ultrasonography OR ultrasonography.mp OR exp ultrasonics OR ultrasonics.mp OR ultrasound.mp] AND [exp adolescence OR exp child OR exp child of impaired parents OR exp child, abandoned OR exp child, exceptional OR exporchid, hospitalised OR exp child, institutionalised OR exp child, preschool OR exp child, unwanted OR exp disabled children OR exp homeless youth/ OR exp infant OR exp only child OR child$.mp OR exp Pediatrics OR pediatric$ .mp OR paediatric$.mp] LIMIT to human AND English.

Table 6

<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>Kaufman RA et al, 1984, USA</td>
<td>95 children with suspected intra-abdominal injury Abdominal CT with contrast v abdominal ultrasound</td>
<td>Diagnostic test study</td>
<td>Intra-abdominal fluid or organ injury identified on initial CT or ultrasound Intra-abdominal injury identified at any stage by any means</td>
<td>2 false negative and 6 false positive CT scans 18 false negative and 3 false positive ultrasound scans</td>
<td>No real gold standard</td>
</tr>
<tr>
<td>Rossi D et al, 1993, Belgium</td>
<td>38 children with intra-abdominal injuries Abdominal CT with contrast v abdominal ultrasound</td>
<td>Diagnostic test study</td>
<td>Intra-abdominal fluid or organ injury identified on initial CT or ultrasound Intra-abdominal injury identified at any stage by any means</td>
<td>CT identified 30 out of 31 cases with intra-abdominal fluid Ultrasound identified 37 out of 38 cases with intra-abdominal fluid CT identified organ injury in 33 out of 38 cases Ultrasound identified organ injury in 14 out of 31 cases</td>
<td>Retrospective Not all patients had both tests No real gold standard</td>
</tr>
<tr>
<td>Akkur FM et al, 1997, Turkey</td>
<td>60 children with blunt abdominal trauma who had abnormal findings on abdominal ultrasound Abdominal CT v abdominal ultrasound</td>
<td>Diagnostic test study</td>
<td>Intra-abdominal fluid or organ injury</td>
<td>CT identified the source of intra-abdominal fluid in 3 patients in whom ultrasound could not identify a source</td>
<td>Sample group selective No real gold standard</td>
</tr>
<tr>
<td>Richardson MC et al, 1997, UK</td>
<td>26 children with blunt abdominal trauma Abdominal CT with contrast v abdominal ultrasound</td>
<td>Diagnostic test study</td>
<td>Intra-abdominal fluid or organ injury identified on initial CT or ultrasound Intra-abdominal injury identified at any stage by any means</td>
<td>CT missed 1 injury. Ultrasound identified organ injury in all 22 patients CT identified organ specific injury in 9 of 12 CT identified organ specific injury in 12 of 24 patients</td>
<td>Retrospective Sample group selective No real gold standard</td>
</tr>
<tr>
<td>Patrick DA et al, 1998, USA</td>
<td>100 children who had abdominal CT and ultrasound performed as investigations for blunt abdominal trauma Abdominal CT v abdominal ultrasound performed by an emergency physician</td>
<td>Diagnostic test study</td>
<td>Intra-abdominal fluid. Organ injury identified on CT or ultrasound Intra-abdominal injury identified at any stage by any means</td>
<td>CT identified 7 intra-abdominal injuries not identified on ultrasound</td>
<td>Retrospective Sample group selective No real gold standard</td>
</tr>
<tr>
<td>Richards JR et al, 2002, USA</td>
<td>744 consecutive children undergoing ultrasonography for trauma</td>
<td>Prospective diagnostic cohort</td>
<td>Detection of haemoperitoneum</td>
<td>US 56% sensitivity, 97% specificity</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Search outcome
Altogether 123 papers were found, of which 117 were irrelevant or of insufficient quality. The remaining six papers are shown in table 6.

Comment(s)
The studies do seem to indicate that CT is better than ultrasound at identifying intra-abdominal injury in children. However, as it is impossible to confirm most of the injuries identified on imaging, it is also difficult to compare the two imaging techniques with a definite gold standard. This also needs to be considered in the light of the clinical scenarios encountered by emergency physicians. Because of the need for transport and the time it takes to perform CT, children with blunt abdominal trauma need to be stable and have no other injuries requiring urgent treatment. Most will also require sedation. Ultrasound can be performed in the resuscitation room, is much quicker, and is much less distressing to a terrified child.

CLINICAL BOTTOM LINE
CT is better than ultrasound at identifying intra-abdominal injury in children.

Routine use of antibiotic ointment and wound healing

Report by A Van Zyl, D Abbott, D Andrews, P Reaves, Senior House Officers
Checked by Hamish Simpson, Consultant

Abstract

A short cut review was carried out to establish whether topical antibiotics improved the outcome of simple wounds. Altogether 71 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 26 year old man attends the emergency department with a simple laceration requiring suturing. You wonder whether application of a topical antibiotic ointment will promote healing and reduce incidence of infection.

Three part question

In [adults with non-contaminated lacerations] does [the application of topical antibiotics] reduce [the incidence of secondary infection, the length of time dressings are required and achieve a better cosmetic result]? 

Search strategy

Medline 1966–07/02 using the OVID interface. [((exp administration, topical OR topical therapy.mp ) AND (exp antibiotics OR antibiotic$.mp) OR "topical antibiotic".mp) AND (exp ointments OR ointments.mp)] AND [exp Staphylococcal infections OR exp Skin OR superficial wound$.mp OR exp Wound healing OR exp Wound infection OR exp"Wounds and Injuries" ] LIMIT to human AND English.

Search outcome

Altogether 71 papers were found of which 70 were irrelevant or of insufficient quality for inclusion. The remaining paper is shown in table 7.

Comment(s)

Although this study suggests that antibiotic ointment reduces incidence of infection there are a number of reasons at the moment why we would be reluctant to change current clinical practice. The intensive wound care used in the study may not mirror our own practice. Long term results and patients own assessment of outcome may be better indicators of the benefit of topical antibiotics, than the short-term effects measured in this trial.

CLINICAL BOTTOM LINE

There is not enough evidence here to change current practice. A large multicentre study is indicated to provide more relevant answers.


Factor VIIa for intractable blood loss in trauma

Report by Jon Argall, Senior Clinical Fellow
Checked by Stewart Teece, Clinical Research Fellow

Abstract

A short cut review was carried out to establish whether factor VIIa is indicated in patients suffering intractable blood loss after trauma. Altogether 39 papers were found using the reported search, of which two 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 29 year old man is brought into the resuscitation area having jumped out of a fourth floor window. He has abdominal and pelvic injuries but no chest, head, or limb injuries. He is bleeding intractably and the orthopaedic team and surgical team cannot agree on a plan of management. You suggest that factor VIIa would help to stabilise the patient and reduce his requirement for transfusion.

Three part question

In [trauma patients with major blood loss and intractable bleeding requiring massive transfusion] does [recombinant factor VIIa] reduce [morbidity and mortality]?

Search strategy

Medline 1966–07/02 using the OVID interface. [exp Factor VII OR exp Factor VIIa OR (factor adj5 VII).af OR (factor

Table 7

<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>Dire DJ et al, 1995, USA</td>
<td>465 patients with minor uncomplicated soft tissue wounds necessitating suturing attending an emergency department. Puncture wounds, wounds over 12 hours old, underlying fracture or neurovascular complication, allergies to agents used, antibiotics within previous 7 days and pregnant or immunocompromised patients were excluded.</td>
<td>Double blind randomised controlled trial</td>
<td>Evidence of infection</td>
<td>Antibiotic ointment is better at reducing infection than petrolatum alone</td>
<td>No mention of methods of randomisation. Wounds treated differently initially. Subjective measurements. Patients responsible for own wound care. Dubious recruitment strategy</td>
</tr>
</tbody>
</table>

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Search outcome
Altogether 59 papers were found of which two were relevant. The details are shown in table 8.

Table 8

<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>Kenet et al, 1999, Israel</td>
<td>One 19 year old male soldier with life threatening bleeding from IVC</td>
<td>Case report</td>
<td>Mortality</td>
<td>Slowing of blood loss and surgical control of bleeding was achieved with two doses of recombinant factor VIIa</td>
<td>Only one case example</td>
</tr>
<tr>
<td>Martinowitz et al, 2001, Israel</td>
<td>Seven massively bleeding, multi-transfused, coagulopathic trauma patients were treated with recombinant factor VIIa after failure of conventional methods to achieve haemostasis</td>
<td>Case series</td>
<td>Reduction in transusion requirements</td>
<td>From 25 - 49 units, to 1 - 2 units</td>
<td>Small study No controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Shortening of PTR and APTT</td>
<td>Reduction from 20 - 31.8 seconds, to 8 - 12 seconds and 46 - 110 seconds to 28 - 46 seconds respectively</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Increase in factor VII levels</td>
<td>From 0.7 - 0.92 IU/ml, to 18 - 44 IU/ml</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mortality</td>
<td>3 of 7 patients died of reasons other than bleeding or thromboembolism</td>
<td></td>
</tr>
</tbody>
</table>

Comment(s)
More studies are needed.

► CLINICAL BOTTOM LINE
Factor VIIa may have a role as a temporising adjunct to surgical haemostasis. Further research is needed.
