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

Edited by K Mackway-Jones

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 practising 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. 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 Six BETs are included in this issue of the journal.

- Reimplantation of the nail root in fingertip crush injuries in children
- Antibiotics in non-venomous snakebite
- Intra-articular lidocaine for acute anterior shoulder dislocation reduction
- Propofol for resistant status epilepticus
- Regional nerve block in fractured neck of femur
- Bronchodilator delivery in acute severe asthma in adults

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Reimplantation of the nail root in fingertip crush injuries in children

Report by Russell Boyd, Consultant
Checked by Carole Libetta, Consultant

Abstract

A short cut review was carried out to establish whether reimplantation of the nail improved cosmetic outcome after crush injury to the fingertip in children. Altogether 35 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 2 year old child presents to the emergency department with a crush injury to the left index finger tip. The fingernail has been avulsed from the proximal nail fold. You wonder if surgical reimplantation of the nail root into the proximal fold will produce a better cosmetic result.

Three part question

In [children with fingertip injuries to the nail root] does [surgical reimplantation] improve [cosmetic outcome]?

Search strategy

Medline 1966 to 12/01 using the OVID interface. [(exp adolescence OR exp child OR exp child of impaired parents OR exp child, abandoned OR exp child, exceptional OR exp child, hospitalized OR exp child, institutionalized 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$.mp) AND exp finger injuries AND (fingertip.mp OR finger tip.mp OR nail$.mp) AND (exp reimplantation OR reimplantation.mp OR reimplantation OR replacement.mp OR replace$.mp OR repair.mp)] LIMIT to human AND English.

Search outcome

Altogether 35 papers were identified, of which one was deemed relevant for inclusion (table 1).

Comment(s)

The outcome was anecdotally related by the authors to the degree of crush injury to proximal nail fold but no evidence was presented to support this. This is a poor study and more research is needed.

Clinical bottom line

No good evidence exists to guide current decisions. Local guidelines should be followed.


Table 1

<table>
<thead>
<tr>
<th>Author, date, and country</th>
<th>Patient group</th>
<th>Study type</th>
<th>Outcomes</th>
<th>Key results</th>
<th>Study weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>O’Saughnessy M et al, 1990, Ireland</td>
<td>64 finger tip injuries in patients aged 1–81 years 10 with nails v 54 without</td>
<td>Retrospective observational</td>
<td>Cosmetic appearance</td>
<td>No difference</td>
<td>Objective scoring mechanism lacking</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nail length</td>
<td>No difference</td>
<td>Included both adults and children</td>
</tr>
</tbody>
</table>
Antibiotics in non-venomous snakebite

Report by Polly Terry, Specialist Registrar

Checked by Kevin Mackway-Jones, Professor

Abstract

A short cut review was carried out to establish whether prophylactic antibiotics reduced the incidence of infection after non-venomous snake bite. Altogether 60 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 26 year old man attends the emergency department having been bitten on his right hand 30 minutes previously by his pet—a non-venomous snake. Examination reveals localised swelling and oedema of his right hand and forearm, he is systematically well, has no relevant previous medical history and is fully antitetanus immunised. You know there is the potential for infection from the snakes fangs and oropharynx, as well as contamination from the victim’s skin and clothing. You thoroughly clean the wound with local wound toilet, and are happy that there is no fang left in situ. You wonder if prophylactic antibiotics are indicated to reduce the risk of infection.

Three part question

In [fit and well adults who have been bitten by a non-venomous snake] do [prophylactic antibiotics] reduce [the incidence of infection]?

Search strategy

Medline 1966–12/01 using the OVID interface. [(exp snake bites OR snake bite$.mp) AND (exp antibiotics OR antibiotics.mp OR antibiotic$.mp)] LIMIT to human AND English.

Search outcome

Altogether 60 papers of which two were relevant (table 2).

Comment(s)

While many studies have identified the variety of potential pathogens from snakebite, few have looked at the role of prophylactic antibiotics and those available are of poor quality. It is interesting to note the low incidence of infection associated with snakebites irrespective of antibiotic treatment or not. Given the low event rate for infection, trials involving larger numbers would need to be undertaken.

► CLINICAL BOTTOM LINE

Prophylactic antibiotics are not indicated in the routine treatment of patients with snakebites from non-venomous snakes if no necrosis is present.


Table 2

<table>
<thead>
<tr>
<th>Author, date and country</th>
<th>Patient group</th>
<th>Study type</th>
<th>Outcomes</th>
<th>Key results</th>
<th>Study weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weed HG, 1993, USA</td>
<td>72 consecutive children and adults with non-venomous snake wounds calling a poisons centre. None of the patients received antibiotics</td>
<td>Observational</td>
<td>Presence of wound infection</td>
<td>No wound infection identified</td>
<td>14% applied topical antibiotics No definition of wound infection No control group</td>
</tr>
<tr>
<td>Blaylock RS, 1999, South Africa</td>
<td>363 patients presenting with snake bites—both venomous (84%) and non-venomous (16%)</td>
<td>Observational</td>
<td>Presence of wound infection</td>
<td>No infections in patients not given antibiotics</td>
<td>Not randomised Antibiotics given on clinical grounds (presence of necrosis) Very little raw result data provided</td>
</tr>
</tbody>
</table>

Intra-articular lidocaine for acute anterior shoulder dislocation reduction

Report by S R Dhinakaran, Clinical Fellow

Checked by Angaj Ghosh, Senior Clinical Fellow

Abstract

A short cut review was carried out to establish how intra-articular lidocaine compared with intravenous analgesia and sedation during reduction of anterior shoulder dislocations. Altogether 146 papers were found using the reported search, of which three 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 middle aged man attends the emergency department having sustained an acute primary anterior shoulder dislocation during a fall. It is impossible to obtain peripheral venous access and you are not able to get him to breathe entonox. You are aware that shoulder dislocations can be reduced with intra-articular lidocaine (IAL). You wonder if IAL is as effective as intravenous analgesia and sedation (IVAS).

Three part question

In [patients with acute traumatic anterior shoulder dislocation] is [intra-articular lidocaine as effective as intravenous analgesia and sedation] at [facilitating reduction and easing pain associated with reduction]?

Search strategy

Medline 1966–12/01 using the Ovid interface. [exp shoulder dislocation OR shoulder dislocation.mp OR “dislocated shoulder”.mp] AND [exp anesthesia, intravenous OR exp anesthetics, intravenous OR “intravenous anesthesia”.mp OR exp analgesia OR exp conscious sedation OR exp diazepam OR exp hypnotics and sedatives OR exp midazolam OR exp sedatives, nonbarbiturate OR sedation.mp OR exp narcotics OR narcotics.mp OR exp morphine OR morphine.mp OR exp meperidine OR meperidine.mp OR exp pethidine OR pethidine.mp OR exp lidocaine OR “lidocaine”.mp OR “lignocaine”.mp OR exp injections, intra-articular OR exp joint diseases OR intraarticular.mp OR exp anesthetics OR exp anesthetics, local OR anesthetics.mp] AND maximally sensitive RCT filter. LIMIT to human AND English.

Search outcome

Altogether 146 papers were found, of which three were relevant (table 3).

Comment(s)

All studies were small and therefore underpowered. Larger studies are therefore needed.

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propofol for resistant status epilepticus

Report by Simon Carley, Specialist Registrar

Abstract

A short cut review was carried out to establish whether propofol is effective at stopping fitting in resistant status epilepticus. Altogether 24 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 Bottom Line

Where intravenous analgesia and sedation needs to be avoided, intra-articular lidocaine should be the analgesic method of choice for reducing shoulder dislocations.


Matthews DE, Roberts T, 1995, USA

Kosnik J, et al 1999, USA

Propofol for Resistant Status Epilepticus

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>Suder PA et al, 1995, Denmark</td>
<td>52 patients with secondary traumatic shoulder dislocation patients IAL (26) v IVAS (26)</td>
<td>PRCT</td>
<td>Result of reduction</td>
<td>No significant difference (p=0.19) 16.1 + 3.5 v 4.7 + 2.9 (p=0.001) Insignificant difference (p=0.19) Insignificant difference (p=0.08)</td>
<td>Small size</td>
</tr>
<tr>
<td>Matthews DE and Roberts T, 1995, USA</td>
<td>30 consecutive patients presenting to the emergency department with acute anterior shoulder dislocation IAL (15) v IVAS (15)</td>
<td>PRCT</td>
<td>Time to reduction. Difficulty of reduction. Subjective pain Complications Time in emergency department</td>
<td>No statistically significant difference No complications Significant reduction in the IAL group</td>
<td>Small size Varies reduction techniques Statistical methods not described</td>
</tr>
<tr>
<td>Kosnik J, et al, 1999, USA</td>
<td>49 patients presenting to the emergency department with acute anterior shoulder dislocation IAL (29) v IVAS (20)</td>
<td>PRCT</td>
<td>Success rate Ease of reduction (SD) Pain score (SD)</td>
<td>20/20 for IVAS v 24/29 for IAL (p=0.07) 3.32 (2.36) for IVAS v 4.45 (2.46) for IAL (p=0.12) 3.95 (2.39) for IVAS v 4.90 (2.34) for IAL (p=0.18)</td>
<td>Small sample size Varies physician experience Varies reduction techniques</td>
</tr>
</tbody>
</table>

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>Mackenzie SJ et al, 1990 Scotland</td>
<td>2 patients with RSE. Standard treatment unsuccessful</td>
<td>Case series</td>
<td>Observation of seizure activity</td>
<td>Propofol stopped seizure activity clinically and on EEG Propofol infusion stopped apparent seizure activity</td>
<td>Case series</td>
</tr>
<tr>
<td>Campanini R et al, 1991 Italy</td>
<td>4 patients on ICU with RSE</td>
<td>Case series</td>
<td>Observation of seizure activity</td>
<td>Propofol appeared to suppress EEG seizure activity</td>
<td>Case report</td>
</tr>
<tr>
<td>Borgeat A et al, 1994 Switzerland</td>
<td>Adult OD patient. Propofol was given to suppress EEG activity</td>
<td>Case report</td>
<td>Observation of EEG activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kuisma M and Roine RO 1993 Finland</td>
<td>8 adult patients in prehospital care with RSE. All patients were intubated and ventilated. All received propofol boluses of 100–200 mg.</td>
<td>Case series</td>
<td>Success at terminating seizures</td>
<td>All patients stopped RSE with propofol</td>
<td></td>
</tr>
<tr>
<td>Harisson AM et al 1998 USA</td>
<td>9/12 child with hereditary fructose intolerance in RSE</td>
<td>Case report</td>
<td>Observation</td>
<td>RSE stopped on infusion of 3 mg/kg propofol Thiopentone 123 min vs propofol 2.6 min (p=0.002) Thiopentone 82% v propofol 63% (NS)</td>
<td>Case report</td>
</tr>
<tr>
<td>Stecker MW et al 1998 USA</td>
<td>16 Adult patients with RSE. All patients intubated. Thiopentone (8) v propofol (8) 1mg/kg over 5 min, repeated if needed.</td>
<td>Open trial</td>
<td>Time to seizure termination (elimination of EEG and clinical seizures) Success at terminating seizures</td>
<td></td>
<td>Case report Rate underlying disorder Open trial. Some of the propofol patients part of another trial. Others identified retrospectively. Very small trial</td>
</tr>
</tbody>
</table>
Comment(s)
The evidence for propofol in RSE is weak. It is based on case series and small open label trials. However, there is some theoretical basis for the use of propofol in RSE and the observations made in the studies presented are encouraging. Further work is clearly needed but in refractory status epilepticus resistant to conventional treatment it would not be unreasonable to try propofol.

CLINICAL BOTTOM LINE
Propofol may be considered as a treatment for status epilepticus if conventional treatments have failed.

Regional nerve block in fractured neck of femur
Report by Bruce Martin, Specialist Registrar
Checked by Baha Ali, Senior Clinical Fellow
Abstract
A short cut review was carried out to establish whether regional nerve block is better than intravenous analgesia in reducing pain in hip fractures. Altogether 21 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 73 year old woman, who is usually fit and well, is brought to the emergency department after a fall. She is complaining of severe pain in her left groin. Examination shows that her left leg is shortened and externally rotated. You make a clinical diagnosis of fractured neck of femur (which is later confirmed radiologically). You wonder whether regional nerve block is better than intravenous analgesia for pain relief.

Three part question
In [patients with suspected neck of femur fracture] is [regional nerve block better than intravenous analgesia] at [providing and maintaining analgesia]?

Search strategy
Medline 1966–12/01 using the OVID interface. (exp femoral neck fractures OR exp hip fractures) AND (exp analgesia OR analgesics.mp) AND (exp nerve block OR nerve block.mp OR exp anesthetics, local OR exp anesthetics, local OR regional analgesia.mp OR regional anaesthesia.mp).

Search outcome
Altogether 21 papers found. Of these only four were relevant to the preoperative setting (table 5).

Comment(s)
The studies suggest some benefit for the use of nerve block in fractured neck of femur in the pre-operative setting, most notably in extracapsular fractures. However, the studies are small and have important weaknesses.

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>Finlayson BJ and Underhill TJ, 1988, UK</td>
<td>36 patients age range 31–95 with fractured neck of femur. Intracapsular (16) and extracapsular (20) Femoral nerve block (10 ml 0.5% bupivocaine)</td>
<td>Cohort study</td>
<td>Objective Assessment Subjective Assessment Complications</td>
<td>29 had reduced sensation. 7 no change (6 intracapsular, 1 extracapsular) 26 patients had reduced pain (14 intracapsular, 12 extracapsular), 4 had no pain (all extracapsular). 6 had no change (all intracapsular) None found</td>
<td>No control group Statistical significance not assessed Heterogeneous group of patients (2 young patients, 1 with multiple injuries)</td>
</tr>
<tr>
<td>Haddad FS and Williams RL, 1995, UK</td>
<td>50 patients with extracapsular fractures of the femoral neck, age range 68–89 Femoral nerve block (0.3 ml/kg 0.25% bupivocaine) vs systemic analgesia alone</td>
<td>RCT</td>
<td>Mean pain score using VAS Analgesic requirements Incidence of complications</td>
<td>Greater reduction in nerve block group — statistically significant at 15 min and 2 hours Reduced in the 24 hours from admission in nerve block group Significantly reduced in nerve block group</td>
<td>Small number of patients. Only extracapsular fractures included. Optimal analgesia given to control group</td>
</tr>
<tr>
<td>Chudinov A et al, 1999, Israel</td>
<td>40 consecutive patients age 67–96 years with fractured neck of femur undergoing surgery. Continuous psoas compartment block (2 mg/kg of 0.25% bupivocaine with 0.8 ml/kg adrenaline) vs analgesia</td>
<td>RCT</td>
<td>Pain relief (VAS) Complication Rate</td>
<td>Significant difference in psoas block group at 8 and 16 hours preoperatively and 16, 24, and 32 hours postoperatively 3 cases of local erythema in psoas group</td>
<td>Method of randomisation unclear. Small numbers of patients. Unblinded. Unclear whether optimal analgesia given to control group. Type of block not typically used in emergency setting</td>
</tr>
<tr>
<td>Parker MJ et al, 2000, UK</td>
<td>269 patients from 7 randomised or quasi-randomised trials with fractured neck of femur — analgesia/anaesthesia given preoperatively in 2 of these trials. Patients given either regional block or intravenous analgesia</td>
<td>Systematic review</td>
<td>Pain levels Analgesic Requirements Complication rate</td>
<td>Reduction in mean pain score in nerve block group Reduced analgesic requirements in nerve block group No difference</td>
<td>Heterogeneous group of patients Trials involving both preoperative and postoperative patients were assessed together Different forms of block used in different trials Small numbers in contributing studies Unclear if amount of parenteral analgesia given was optimal</td>
</tr>
</tbody>
</table>

www.emjonline.com
In patients with suspected fractured neck of femur, regional nerve block may be of benefit in reducing parenteral analgesic requirements.


Bronchodilator delivery in acute severe asthma in adults

Report by Stuart Teece, Research Fellow

Search checked by Kevin Mackway-Jones, Professor

Clinical scenario
A 24 year old known asthmatic is brought into the emergency department by friends. She has been in a smoky bar and has become very wheezy. You assess her asthma as severe. You wonder whether a nebuliser is necessary, or whether a spacer device will suffice.

Three part question
In an adult with acute severe asthma is delivery of bronchodilator therapy via nebuliser or spacer better at improving airflow and reducing the need for admission?

Search strategy
Medline 1966–12/01 using the OVID interface. ([exp asthma OR asthma.mp] AND [exp bronchodilator agents OR bronchodilator$.mp] AND [exp nebulizers and vaporizers OR nebulise$.mp OR nebulize$.mp OR spacer$.mp]) LIMIT to human AND english language.

Search outcome
Altogether 1734 papers found of which two were meta-analyses that included all other relevant papers (table 6).

Comment
The two meta-analyses have four studies (199 patients) in common.

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>Turner MO et al, Canada, 1997</td>
<td>12 of 18 randomised trials (507 patients)</td>
<td>Meta-analysis</td>
<td>Effect size</td>
<td>−0.02 (−0.2 to 0.16)</td>
<td>Includes 102 patients with COPD</td>
</tr>
<tr>
<td>Cates C and Rowe BH, UK, 2001</td>
<td>7 of 44 randomised trials (375 patients)</td>
<td>Systematic review</td>
<td>FEV1</td>
<td>No significant difference</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>PEFR</td>
<td>No significant difference</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Length of stay</td>
<td>No significant difference</td>
<td></td>
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</table>