

BEST EVIDENCE TOPIC REPORTS

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.¹ Each BET has been constructed in the four stages that have been described elsewhere.² The four topics covered in this issue are:

- Admission of isolated sternal fractures for observation
- Management of household electrical injury
- Steroid delivery in croup
- Haematoma block versus intravenous regional anaesthesia in Colles' fracture

1 Carley SD, Mackway-Jones K, Jones A, *et al.* Moving towards evidence-based emergency medicine: use of a structured critical appraisal journal club. *J Accid Emerg Med* 1998;15:220-2.
 2 Mackway-Jones K, Carley SD, Morton RJ, *et al.* The best evidence topic report: a modified CAT for summarising the available evidence in emergency medicine. *J Accid Emerg Med* 1998;15:222-6.

Admission of isolated sternal fracture for observation

Report by Andy Jones, *senior registrar*
 Search checked by Wendy Dollery, *senior registrar*

Clinical scenario

A 30 year old man presents having been involved in a front end collision while driving a car at 40 mph. He is found to have sternal tenderness and an x ray reveals a fracture. There are no other significant injuries.

Three part question

In an [adult with an isolated sternal fractures following a road traffic accident] is [routine admission] warranted to [detect possible cardiac events].

Search strategy

Medline 1966 to 12/97 using the OVID interface. ({[exp accidents traffic OR traffic ti,ab,sh] AND [exp sternum OR sternum. ti,ab,sh] AND [exp fractures OR fractures. ti,ab,sh]} LIMIT to [human AND english language])

Table 1

Author, date, and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Brookes <i>et al.</i> , 1993, Australia ¹	272 fractures over 6.5 years, 124 isolated fractures, 93% from RTAs	Retrospective view	Accident details fracture grade, cardiac sequelae	Isolated fracture minimal complications, arrhythmias seen with age > 65, IHD, digoxin	Possible missed fractures, data retrospective
Hills <i>et al.</i> , 1993, Australia ²	172 fractures over 6.5 years, 89% from RTAs	Prospective cohort study	Associated injuries	No clear association with intrathoracic injury. Slight increase in thoracic spine injury	Data collection uncertain, no uniform cardiac screen
Bu'Lock <i>et al.</i> , 1994, UK ³	63 patients with central chest trauma, 45 seat belt related	Prospective cohort study	ECG findings and cardiac enzymes, echocardiography	None of these needed treatment and no adverse effects - ECG and enzymes correlated poorly with these findings, 25% of isolated seat belt injuries had pericardial effusion	Small numbers, not all had fractures

ECG=electrocardiography; IHD=ischaemic heart disease; RTAs=road traffic accidents.

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Search outcome

Six papers found of which one irrelevant and two of insufficient quality for inclusion; the remaining papers are shown in table 1.

Comment

Studies are not of best quality. More rigorous prospective studies with larger numbers are required to make definite recommendations. Isolated sternal fractures caused by seat belts with no associated injuries and normal electrocardiography and chest radiology appear to be benign and can be discharged provided pain

not severe. The situation with sternal fractures caused by other mechanisms is less clear.

Clinical bottom line

Patients with isolated sternal fractures caused by seat belts who have a normal electrocardiography, chest radiography, and stable vital signs can be discharged.

- 1 Brookes JG, Dunn RJ, Rogers IR. Sternal fractures: a retrospective analysis of 272 cases. *J Trauma* 1993;35:46-54.
- 2 Hills MW, Delprado AM, Deane SA. Sternal fractures: associated injuries and management. *J Trauma* 1993;35:55-60.
- 3 Bu'Lock FA, Prothero A, Shaw C, *et al.* Cardiac involvement in seat belt related and direct sternal trauma: a prospective study and management implications. *Eur Heart J* 1994;15:1621-7.

Management of household electrical injury

Report by Wendy Dollery, *senior registrar*
Search checked by Katrina Herren, *research fellow*

Clinical scenario

A 30 year old male electrician attends the emergency department having suffered an electrical shock while servicing a washing machine. There was no water involved.

Three part question

In [patients who have sustained a household voltage electrical injury with normal initial electrocardiography] is [admission for monitoring] necessary to [reduce the risk of sudden death from cardiac arrhythmias]?

Search strategy

Medline 1966 to 12/97 using the OVID interface. {[exp electrical injury OR exp burns electric OR electrical injuries. ti,ab,sh] AND [exp monitoring, physiologic or monitoring. ti,ab,sh]}

Search outcome

Forty four papers found of which 39 were irrelevant; the remaining papers are shown in table 2.

Comment

While there are numerous case reports in the literature of dysrhythmias developing after both 240 volt and high voltage electrical injury no studies have shown onset of dysrhythmia after initial assessment. Only observational studies were identified looking at household electrical injury and late onset cardiac arrhythmias.

Clinical bottom line

Routine cardiac monitoring is not required after household voltage electrical injury if the patient is asymptomatic and has normal initial electrocardiography. Asymptomatic patients involved in minor electrical events do not require investigation or admission.

- 1 Fatovich DM, Lee KY. Household electrical shocks: who should be monitored? *Med J Aust* 1991;155:301-3.
- 2 Cunningham P. The need for cardiac monitoring after electrical injury. *Med J Aust* 1991;154:765-6.
- 3 Bailey B, Gaudreault P, Thiverge RL, *et al.* Cardiac monitoring of children with household electrical injuries. *Ann Emerg Med* 1995;25:612-17.
- 4 Garcia CT, Smith GA, Cohen DM, *et al.* Electrical injuries in a paediatric emergency department. *Ann Emerg Med* 1995;26:604-8.
- 5 Wallace BH, Cone JB, Vanderpool RD, *et al.* Retrospective evaluation of admission criteria for paediatric electrical injuries. *Burns* 1995;21:590-3.

Table 2

Author, date, and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Fatovich and Lee, 1991, Australia ¹	20 patients exposed to 240 volts AC electric supply	Observational study, literature review	Initial ECG, cardiac monitor	2/20 abnormal, no new abnormality detected	Retrospective, no statistical analysis
Cunningham, 1991, Australia ²	70 patients exposed to 240 volts AC electric supply	Observational study, survey of management policy	Initial ECG, cardiac monitor	11/59 abnormal, 6 deaths, no new abnormality detected	Retrospective, no statistical analysis
Bailey <i>et al.</i> , 1995, Canada ³	151 children (age 8 months to 18 years) exposed to 120 or 240 volts AC electric supply	Observational study	Initial ECG, cardiac monitor	1/113 abnormal, no new abnormality detected	Retrospective, missing data
Garcia <i>et al.</i> , 1995, USA ⁴	Patients aged less than 21 years exposed to minor (< 1000 volts) electrical injury	Observational study	Initial ECG, cardiac monitor	2/53 abnormal, no new abnormality detected	Retrospective, missing data
Wallace <i>et al.</i> , 1995, USA ⁵	26 children exposed to 120 or 240 volts AC electric supply	Observational study	Initial ECG, cardiac monitor	1/17 abnormal, no new abnormality detected	Retrospective

ECG=electrocardiography.