BEST EVIDENCE TOPIC REPORTS

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

Edited by K Mackway-Jones

Emerg Med J 2006;23:803–806. doi: 10.1136/emj.2006.041087

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 to allow clinicians to update searches whenever necessary. Each BET is based on a clinical scenario and ends with a clinical bottom line that indicates, in light of the evidence found, what the reporting clinician would do if faced with the same scenario again. The BETs published below were first reported at the Critical Appraisal Journal Club at the Manchester Royal Infirmary¹ or placed on the BestBETs website. Each BET has been constructed in the four stages that have been described elsewhere.² The BETs shown here, those published previously and those currently under construction, can be seen at <http://www.bestbets.org>.³ Three BETs are included in this issue of the journal.

- ▶ Accuracy of emergency department ultrasound in detecting abdominal aortic aneurysms
- ▶ Use of aspirin in acute stroke
- ▶ Myringotomy in traumatic haemotympanum

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.

3 Mackway-Jones K, Carley SD. bestbets.org: odds on favourite for evidence in emergency medicine reaches the worldwide web. *J Accid Emerg Med* 2000;17:235–6.

Accuracy of emergency department ultrasound scanning in detecting abdominal aortic aneurysm

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doi: 10.1136/emj.2006.041095

Abstract

A short-cut review was carried out to establish whether emergency department ultrasound scanning had clinical utility for the diagnosis of abdominal aortic aneurysm (AAA). A total of 73 papers were found using the reported searches, of which 4 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. It is concluded that in patients suspected of having AAA, emergency department bedside ultrasound scanning for AAA is sensitive and specific and may improve patient care.

Clinical scenario

A 55-year-old man presents to the emergency department with a sudden onset of abdominal and flank pain associated with hypotension. Our concern is that he may have an AAA, but at this time the patient is too unstable to leave the emergency department for formal imaging. The vascular surgeons suggest a bedside ultrasound study. We perform one scan and see no AAA. Can you be confident that an ultrasound scan performed by an emergency physician can accurately rule in or out an AAA?

Three-part question

In [patients suspected of having abdominal aortic aneurysms] is [ED bedside ultrasound performed by EM physicians as good as that performed by radiologists] at [accurately detecting AAA?]

Search strategy

Medline 1966–week 3 July 2006 using the Ovid interface, and Embase 1980–week 29 2006 using Multifile searching, and *Cochrane Library* Issue 3 2006.

Medline/Embase: [(exp aortic aneurysm, abdominal/ultrasonography) and (exp emergency.mp. or emergencies/)]. LIMIT to human and English.

Cochrane Library: Aortic Aneurysm, Abdominal/US [MeSH] and Emergencies [MeSH] 0 records.

Outcome

A total of 73 papers were found, of which 69 were irrelevant or of insufficient quality. Table 1 summarises the contents of remaining four papers.

Comments

Although all of these studies probably had some degree of selection bias, these are the patients who are most likely to benefit from early detection of AAA. It would have been helpful if they had included information on patients who may have been excluded because of body habitus or potential difficulty in scanning. The amount of training in ultrasound scanning does not seem to affect the accuracy.

▶ CLINICAL BOTTOM LINE

In patients suspected of having AAA, emergency department bedside ultrasound scanning for AAA is sensitive and specific and may improve patient care.

Tayal V, Graf C, Gibbs M. Prospective study of accuracy and outcome of emergency department ultrasound for abdominal aortic aneurysm over two years. *Acad Emerg Med* 2003;10:867–71.

Knaut A, Kendal J, Patten R, *et al*. Ultrasonographic measurement of aortic diameter by emergency physicians approximates results obtained by computed tomography. *J Emerg Med* 2005;28:119–126.

Table 1

Author, date, country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Tayal <i>et al</i> , 2003, USA	All patients suspected of having AAA	Diagnostic cohort	Positive or negative for AAA defined as abdominal aorta diameter >3 cm	29/125 scans positive for AAA. 27/29 positive on confirmatory test. Sensitivity = 100%, Specificity = 98%, NPV = 100%, PPV = 93%	Small number of patients. Lack of clear inclusion and exclusion criteria may have led to selection bias
Knaut <i>et al</i> , February 2005, USA	Emergency bedside ultrasound performed by EM physicians followed by a confirmatory test, ie, radiology ultrasound, abdominal CT, abdominal MRI and laparotomy. Convenience sample of patients ≥50 years with abdominal pain and scheduled for abdominal and pelvic CT scan with IV contrast as part of their evaluation.	Diagnostic cohort	AAA diagnosed by ultrasound and confirmed by CT	5/104 diagnosed by US were confirmed by CT. No false negatives. PPV of 0.00 at SMA, 0.67 in longitudinal view and 0.80 at bifurcation. NPV 0.099, 0.99 and 1.00, respectively	Convenience sample could lead to selection bias
Constantino <i>et al</i> , November 2005, USA	Ultrasound to measure the diameter of the abdominal aorta by either a resident or attending emergency medicine physician. Patients ≥55 years with at least one of the following: abdominal, back, flank or chest pain or hypotension as well as clinical suggestion of AAA	Diagnostic cohort	Difference in measured diameter at SMA, bifurcation and longitudinal view AAA measuring >3.0 cm on ultrasound	<1.41 cm at SMA, <1.05 at bifurcation and <0.94 in longitudinal view 95% of the time 36/238 had abnormal aortas, 34 AAA, 1 aortic dissection, 1 intraluminal clot. Sensitivity 100% for aortic abnormality, 94% for AAA. Specificity 100% for both end points	Did not include patients who went to OR for repair were not scanned Possible selection bias. Residents who performed EUS may have had more extensive training than most
Kuhn <i>et al</i> , September 2000, Australia	EUS performed by 3rd year EM residents. Patients in whom AAAs were expected, including those patients over ≥50 years presenting with abdominal/back pain of unclear origin or presumed renal colic. ED bedside ultrasound preformed by EM physician who had attended a 3-day ultrasound training course.	Diagnostic cohort	Positive for AAA defined as aortic diameter >3 cm Improvement of patient care	68 patients scanned, aorta visualised in 66. 26 true positives and 40 true negatives Sensitivity = 100%, Specificity = 100%, PPV = 100%, NPV = 100% Improved care in 46 patients, 0 adversely affected	Small study, only 68 participants Convenience sampling may have led to bias in selecting patients who are easier to scan or who have high clinical suspicion of AAA

AAA, abdominal aortic aneurysm; CT, computed tomography; ED, emergency department; EM, emergency medicine; EUS, endoscopic ultrasound scanning; IV, intravenous; NPV, negative predictive value; OR, operating room; PPV, positive predictive value; SMA, superior mesenteric artery; US, ultrasound scan.

Constantino T, Bruno E, Handly N, *et al*. Accuracy of emergency medicine ultrasound in the evaluation of abdominal aortic aneurysm. *J Emer Med* 2005;29:455–60.

Kuhn M, Bonnin R, Davey M, *et al*. Emergency department ultrasound scanning for abdominal aortic aneurysm: accessible, accurate and advantageous. *Ann Emer Med* 2000;36:219–23.

Use of aspirin in acute stroke

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doi: 10.1136/emj.2006.041103

Abstract

A short-cut review was carried out to establish whether the administration of aspirin before computed tomography scanning improved outcome in patients with symptoms suggestive of stroke. In all, 866 papers were found using the reported searches, two of which presented the best evidence to answer the clinical question. The author group, date and country of publication, patient group studied, study type, relevant outcomes, results and study weaknesses of

these best papers are tabulated. If a computed tomography scan is to be carried out within 48 h of onset of symptoms, then it is prudent to await the result before starting aspirin.

Clinical scenario

A 67-year-old man with a history of angina presents with a sudden onset of left-sided weakness in the early evening. You know that the patient will not undergo a computed tomography scan until the next day and that if he is having a cerebral infarction he may receive some benefit from starting aspirin. You wonder if the potential benefit outweighs a possible increase in the risk of worsening any intracranial haemorrhage.

Three-part question

In [patients presenting with symptoms suggestive of a CVA [cerebrovascular event]] does [the administration of aspirin] prior to CT scan [improve outcome]?

Search strategy

Medline 1966–week 4 July 2006 using the Ovid interface, and *Cochrane Library*, 2006 Issue 3. Medline: [exp Cerebrovascular Accident/or stroke\$.mp. or cerebrovascular accident\$.mp.] and