Table 2

Author, country, date	Patient group	Study type	Outcomes	Key results	Study weaknesses
Boyle *et al*, 1993, USA	8 healthy volunteers, age range 18–50 years given 1.45 mg/kg glipizide. When glucose had dropped to 50 mg/dl then 50 ml 50% glucose was given followed by either variable dextrose infusion or octreotide. At 5 h a second 50% glucose bolus was administered and the time to return to target glucose value was measured	Experimental study on healthy volunteers	Time to return to target glucose value of 85 mg/dl after second 50% glucose bolus	3 h vs 6.5 h (p = 0.001)	Small number, experimental study. Not blinded, subject to bias
Mclaughlin *et al*, 1999, USA	9 patients of whom 6 had taken glyburide OD and 3 glipizide OD. Age range 20–65 years	Observational	Mean number of episodes of hypoglycaemia before and after treatment with octreotide Mean number of ampoules of 50% dextrose before and after treatment with octreotide	3.2 vs 0.2 (p = 0.008) 2.9 vs 0.2 (p = 0.004)	Retrospective chart review design. Sample size small

OD, once daily.

► CLINICAL BOTTOM LINE

Octreotide may be safe and effective in preventing rebound hypoglycaemia in sulfonlyurea overdose. Octreotide in combination with dextrose can be considered for first line therapy in the treatment of sulfonlyurea-induced hypoglycaemia

Boyle PJ, Justice K, Krentz AJ, *et al.* Octreotide reverses hyperinsulinemia and prevents hypoglycemia induced by sulfonylurea overdoses. *Jl Clin Endcrinol Metab* 1993;**76**:752–6.
McLaughlin SA, Crandall CS, McKinney PE. Octreotide: an antidote for sulfonylurea-induced hypoglycemia. *Ann Emerg Med* 2000;**36**:133–8.

Ultrasound to detect haemothorax after chest injury

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Abstract

A short cut review was carried out to establish whether ultrasonography is as sensitive and specific as chest *x* ray or computed tomography (CT) scan in detecting haemothorax after chest trauma. Thirty-nine papers were found using the reported searches, 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 shown in table 3. It is concluded that ultrasonography is more sensitive and as specific as chest *x* ray at detecting haemothorax in patients with chest trauma.

Three-part question

[In adults with thoracic trauma] does [emergency department ultrasonography have better clinical utility than chest *x* ray] at [diagnosing haemothorax]?

Clinical scenario

A patient arrives in the emergency department after suffering thoracic trauma. A member of the team suggests using ultrasound to search for the presence of haemothorax, as an extension of the usual FAST assessment. You wonder how accurate the ultrasound would be compared to either the usual initial supine chest *x* ray or to a CT scan which could be performed later in the patient's assessment.

Search strategies

Medline 1966 to present (accessed 29 May 2007) using the OVID interface: [thorax.mp or thoraxic.mp or thoracic.mp or emergancy.mp or chest.mp or pulmonary diseases.mp or thoracic lesions.mp or chest disease.mp]AND [radiography.mp or diagnosis/ or diagnosis, computer assisted/ or diagnosis, differential/ or ''diagnostic techniques and procedures''/ or diagnostic imaging/ or radiography or radiography, thoracic/ or tomography, x-ray/ or ultrasonography/ or diagnostic techniques, cardiovascular/ or diagnostic techniques, respiratory system/ or diagnostic tests, routine/ or realy diagnosis or computed tomography.mp or CT.mp or thoracic CT.mp] AND [ultrasound.mp or ultrasonography.mp or explode ultrasonography/ or sonography.mp or radiological diagnosis.mp or ultrasonographic.mp or thoracic radiological procedures.mp or emergency ultrasound.mp or transthoracic ultrasound.mp or thoracic ultrasound.mp] AND [Hemathorax.mp or hemothorax.mp or haemathorax.mp or haemothorax.mp or traumatic effusion.mp].

The Cochrane Library Issue 2 2007: (hemothorax):ti,ab,kw OR (haemothorax):ti,ab,kw

Outcome

Altogether 39 papers were found in Medline, of which 34 were irrelevant or of insufficient quality. Twenty-five papers were found in Cochrane—the only relevant paper had already been found in Medline. A further paper was found by scanning the references of relevant papers. All relevant papers are summarised in table 3.

Comments

Ultrasound is a sensitive, specific and accurate technique for detecting haemothorax in thoracic trauma patients. CT does detect some haemothoraces not seen on ultrasound; however, in a clinical situation, the two methods are performed on different patient populations and so are not directly comparable. The most clinically relevant diagnostic imaging method with which to compare ultrasound is the supine chest radiograph as they both are performed in the initial assessment of the patient. When compared directly to the supine chest *x* ray, ultrasound is shown to be more specific at detecting the presence of the haemothorax and is at least as specific and accurate. It also has the added advantage of being able to be performed in much less time, making it a useful diagnostic tool for the early diagnosis of haemothorax. However, it cannot replace the chest *x* ray as many other injuries can be shown on the chest *x* ray that cannot be demonstrated by ultrasound.

Table 3

Author, date, country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Rothlin *et al*, 1993, Switzerland	Adults (aged 15–88 years) with blunt thoracic or abdominal injuries. Ultrasound scan by surgeons compared to the patients' clinical outcome and other diagnostic techniques	Prospective study	Clinical utility of ultrasound to detect haemothorax	Sensitivity 81%	Poor gold standard. Not performed by emergency physicians. Some of the beginner surgeons initially forgot to check for haemothorax, accounting for 5 of the 11 cases of false negative reports by ultrasound. Some of the effusions developed only after the first 24 h and therefore would not have been visible on the initial ultrasound scan
Ma *et al*, 1995, USA	245 adult (18 years +) patients presenting to the emergency department with major blunt or penetrating torso trauma. Diagnosis with ultrasound was compared to a combination of results of other diagnostic techniques including CT scan, supine chest *x* ray, formal two-dimensional echocardiography or tube thoracostomy	Diagnostic cohort	Clinical utility of rapid ultrasound assessment at detecting the presence of haemothorax	Sensitivity 96%, specificity 100%, accuracy 99%	Composite gold standard
Ma and Mateer, 1997, USA	240 adults (aged 18 years+) presenting to the emergency department with a major blunt or penetrating torso trauma. Accuracy of ultrasound compared with that of initial plain supine chest *x* ray for the detection of haemothorax using a combination of CT and tube thoracostomy as the gold standard	Retrospective analysis of a prior prospective study	Clinical utility of ultrasound vs initial plain supine chest *x* ray for the detection of haemothorax	Sensitivity 96.2% vs 96.2%, specificity 100% vs 100%, accuracy 99.6% vs 99.6%	The same patients as reference 2
Sisley *et al*, 1998, USA	Patients with suspected blunt or penetrating torso injury who required a chest radiograph for a complete evaluation	Prospective study	Clinical utility of ultrasound vs supine chest *x* ray at detecting the presence of haemothorax	Sensitivity 97.5% vs 92.5%, specificity 99.7% vs 99.7%, PPV 97.5% vs 97.4%, NPV 99.7% vs 99.1%	The results of ultrasound were compared to those of supine chest *x* ray rather than them both being compared to an independent ''gold standard''. Emergency physicians did not perform the ultrasound scan
Abboud and Kendall, 2003, USA	Blunt trauma patients who underwent CT scan of their chest as part of their clinical assessment	Prospective study	Clinical utility of ultrasound	Sensitivity 12.5%, specificity 98.4%	None of the haemothoraces detected by CT but not on ultrasound were large enough to be clinically relevant. The interval between the ultrasound scan and the CT scan was up to 4 h
Brooks *et al*, 2004, UK	Patients triaged to the resuscitation room with thoracic trauma (blunt or penetrating). Ultrasound findings were compared against a combination of other diagnostic methods including supine chest *x* ray, intercostal drain, CT or tube thoracotomy	Prospective study	Clinical utility of ultrasound at detecting the presence of haemothorax	Sensitivity 92%, specificity 100%, accuracy 98%, PPV 100%, NPV 98%	Composite gold standard

CT, computed tomography; NPV, negative predictive value; PPV, positive predictive value.

► CLINICAL BOTTOM LINE

Ultrasound is a sensitive, specific and accurate method to detect the presence of haemothorax in trauma patients. It cannot, however, replace chest radiography because there is additional information on the *x* ray that ultrasound cannot provide.

Rothlin M, Naf R, Amgwerd M, *et al*. Ultrasound in blunt abdominal trauma. *J Trauma* 1993;**34**:488–95.
Ma OJ, Mateer JR, Ogata M, *et al*. Prospective analysis of a rapid trauma ultrasound examination performed by emergency physicians. *J Trauma* 1995;**38**:979–95.
Ma OJ, Mateer JR. Trauma ultrasound examination versus chest radiography in the detection of hemothorax. *Ann Emerg Med* 1997;**29**:312–5.
Sisley AC, Rozyyeki GS. Rapid detection of traumatic effusion on using surgeon-performed ultrasonography. *J Trauma* 1998;**44**:291.
Abboud PA, Kendall J. Emergency department ultrasound for hemothorax after blunt traumatic injury. *J Emerg Med* 2003;**25**:181–4.
Brooks A, Davies B, Smethhurst M, *et al*. Emergency ultrasound in the acute assessment of haemothorax. *Emerg Med J* 2004;**21**:44–6.

Aminophylline in bradyasystolic cardiac arrest

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Abstract

A short cut review was carried out to establish whether aminophylline improved return of spontaneous circulation rates and eventual