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[Intervention Review]

Emergency ultrasound-based algorithms for diagnosing blunt abdominal trauma

Dirk Stengel¹, Kai Bauwens², Jalid Sehoul³, Grit Rademacher⁴, Sven Mutze⁵, Axel Ekkernkamp⁶, Franz Porzsolt⁷

¹Centre for Clinical Research, Department of Trauma and Orthopaedic Surgery, Unfallkrankenhaus Berlin, Berlin, Germany. ²Department of Trauma, Unfallkrankenhaus Berlin, 12683 Berlin, Germany. ³Department of Gynaecology & Obstetrics, Charité-Virchow University Hospital, 13353 Berlin, Germany. ⁴Institute of Diagnostic & Interventional Radiology, Unfallkrankenhaus Berlin, 12683 Berlin, Germany. ⁵Institute of Diagnostic & Interventional Radiology, Unfallkrankenhaus Berlin, 12683 Berlin, Germany. ⁶Department of Trauma Surgery, Ernst-Moritz-Arndt University Hospital, 17487 Greifswald, Germany. ⁷Evidence-Based Health Care Working Group, Ludwig-Maximilians - University of Munich, Munich, Germany

Contact address: Dirk Stengel, Centre for Clinical Research, Department of Trauma and Orthopaedic Surgery, Unfallkrankenhaus Berlin, Warener Str 7, Berlin, 12683, Germany. stengeldirk@aol.com.

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ABSTRACT

Background

Ultrasonography is regarded as the tool of choice for early diagnostic investigations in patients with suspected blunt abdominal trauma. Although its sensitivity is too low for definite exclusion of abdominal organ injury, proponents of ultrasound argue that ultrasound-based clinical pathways enhance the speed of primary trauma assessment, reduce the number of computed tomography scans and cut costs.

Objectives

To assess the efficiency and effectiveness of trauma algorithms that include ultrasound examinations in patients with suspected blunt abdominal trauma.

Search methods

We searched the Cochrane Injuries Group's Specialised Register, CENTRAL, MEDLINE, EMBASE, CINAHL, publishers' databases, controlled trials registers and the Internet. Bibliographies of identified articles and conference abstracts were searched for further eligible studies. Trial authors were contacted for further information and individual patient data. The searches were last updated in January 2008.

Selection criteria

Studies: randomised controlled trials (RCTs) and quasi-randomised trials (qRCTs). *Participants:* patients with blunt torso, abdominal or multiple trauma undergoing diagnostic investigations for abdominal organ injury. *Interventions:* diagnostic algorithms comprising emergency ultrasonography (US). *Controls:* diagnostic algorithms without US ultrasound examinations (for example, primary computed tomography [CT] or diagnostic peritoneal lavage [DPL]). *Outcome measures:* mortality, use of CT and DPL, cost-effectiveness, laparotomy and negative laparotomy rates, delayed diagnoses, and quality of life.

Data collection and analysis

Two authors independently selected trials for inclusion, assessed methodological quality and extracted data. Where possible, data were pooled and relative risks (RRs), risk differences (RDs) and weighted mean differences, each with 95% confidence intervals (CIs), were calculated by fixed- or random-effects modelling, as appropriate.

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Main results

We identified four studies meeting our inclusion criteria. Overall, trials were of moderate methodological quality. Few trial authors responded to our written inquiries seeking to resolve controversial issues and to obtain individual patient data. We pooled mortality data from three trials involving 1254 patients; relative risk in favour of the US arm was 1.00 (95% CI 0.50 to 2.00). US-based pathways significantly reduced the number of CT scans (random-effects RD -0.52, 95% CI -0.83 to -0.21), but the meaning of this result is unclear. Given the low sensitivity of ultrasound, the reduction in CT scans may either translate to a number needed to treat or number needed to harm of two.

Authors' conclusions

There is currently insufficient evidence from RCTs to justify promotion of ultrasound-based clinical pathways in diagnosing patients with suspected blunt abdominal trauma.

PLAIN LANGUAGE SUMMARY

No evidence in favour of using ultrasound to aid diagnosis of patients with a 'blunt' injury to the abdomen

Many people admitted to hospital after an injury have 'blunt' (that is, not penetrating) damage to the abdomen. Doctors treating these patients need to know whether the organs within the abdomen have been injured. Ultrasound scans are believed to help diagnose the patient's condition. In this review, the authors looked for studies that compared death rates in patients with an abdominal injury where ultrasound was used to aid diagnosis with death rates where no ultrasound was used. They also looked for evidence that ultrasound use could reduce the need to carry out other more complex and more expensive diagnostic tests. However, very few trials have been done and the authors conclude there is insufficient evidence to justify the use of ultrasound as part of the diagnosis of patients with abdominal injury.