Speed and efficiency in the resuscitation of blunt trauma patients with multiple injuries: the advantage of diagnostic peritoneal lavage over abdominal computerized tomography

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Diagnostic peritoneal lavage (DPL) for evaluation of adult blunt trauma patients with multiple injuries.

Type of intervention
Diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
Adult blunt trauma patients with multiple injuries.

Setting
Tertiary care. The economic study was conducted in Charlottesville, Virginia, USA.

Dates to which data relate
Effectiveness and resource use data were collected during 1994. Although it is not clearly stated, it appears that cost data were from the same period.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
Costing was undertaken retrospectively on the same patient sample as that used in the effectiveness analysis.

Study sample
Power calculations were not used to determine sample size. During 1994, 1,182 trauma patients were admitted to the UVA trauma centre. 589 patients were admitted before July 1994 and 593, after this date. On 1 July 1994, a new protocol was introduced in which the indications for DPL were broadened to include blunt trauma patients with multiple injuries and those patients in whom accurate exclusion of abdominal injury was needed rapidly. In addition, strict criteria were established whereby only haemodynamically stable patients underwent abdominal CT. The mean Injury Severity Scores (ISS) for the two groups of patients were similar.

Study design
This was a non-randomised controlled study with historical controls, carried out in a single centre.

**Analysis of effectiveness**
The analysis of effectiveness was based on intention to treat. The main outcomes considered were: time spent in the emergency department before definitive placement or surgical intervention and specificity, sensitivity and accuracy of the two tests. Groups were found to be comparable with respect to their Injury Severity Scores.

**Effectiveness results**
Patients in the second period, when DPL was used more frequently, spent significantly less time in the emergency department (285 minutes +/-161 versus 334 minutes +/- 175). The accuracy rate was 99.2% for CT and 98.4% for DPL while sensitivity and specificity were found to be similar. No missed injuries were identified in either group.

**Clinical conclusions**
Many factors, such as the availability of the technician, preparation of the oral and intravenous contrast medium and problems with intravenous access may have contributed to the extended period spent in the emergency department for CT compared to DPL. The increased morbidity and mortality resulting from delays in the diagnosis of intra-abdominal injury were minimised with a quick, safe and accurate diagnostic test, such as DPL.

**Measure of benefits used in the economic analysis**
The authors did not provide any measure of benefits.

**Direct costs**
Costs and quantities were not reported separately. Hospital cost and physician fees were considered in the cost analysis. Discounting was not applied because of the short time frame of the study. The price year was not stated, but seems to have been 1994.

**Statistical analysis of costs**
Not carried out.

**Currency**
US dollars ($).

**Sensitivity analysis**
Not carried out.

**Estimated benefits used in the economic analysis**
Not applicable.

**Cost results**
The total cost for CT was $1,009 and for DPL was $247.

**Synthesis of costs and benefits**
Not applicable.
Authors' conclusions
Patients with severe head injury, open fractures, or any evidence of haemodynamic instability are better served by DPL as the primary diagnostic modality. Its sensitivity and specificity are equivalent to those of CT; this facilitates evaluation and allows for simultaneous procedures, quicker initiation of definitive treatment, and cost containment.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparators (DPL versus CT) is clear, as both diagnostic techniques were widely used in the authors' setting. You, as a database user, should consider whether this is the case in your own setting.

Validity of estimate of measure of effectiveness
The internal validity of the effectiveness results seems to be assured.

Validity of estimate of measure of benefit
No benefit measure was used in the economic analysis and, therefore, the study can be classified as a cost-consequences study.

Validity of estimate of costs
No details were provided concerning the costs analysis and this limits the generalisability of the study results.

Other issues
The authors made appropriate comparisons with other studies.

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