Bedside percutaneous tracheostomy with bronchoscopic guidance in critically ill patients
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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
Bedside percutaneous dilatational tracheostomy (PDT) with bronchoscopic guidance versus standard open tracheostomy for critically ill patients.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The population studied included critically ill patients: trauma, medical, or cardiac surgery patients with persistent respiratory failure or coma requiring prolonged mechanical ventilation.

Setting
Hospital. The study was carried out in Texas, USA.

Dates to which data relate
The effectiveness data were collected between 1992 and 1995. Neither the dates associated with the collection of resource use data nor those for the prices used were given.

Source of effectiveness data
Effectiveness data were derived from a single study and review of previously completed studies.

Link between effectiveness and cost data
It was not clearly reported how the costing was performed.

Study sample
162 patients were included to be treated by bedside percutaneous dilatational tracheostomies (PDT). Power calculations did not determine the sample size.

Study design
Case series. The study was conducted at a single location. The follow-up period was not clearly stated. The loss to follow-up was 78.8%.
Analysis of effectiveness
The basis for the analysis of the clinical study was not relevant. The primary health outcomes used in the analysis were mortality rates and complications relating to the technique.

Effectiveness results
Twenty-five patients (15.4%) died while hospitalized but these events were not related to tracheostomy. There were 4 (2.5%) major complications: one pneumothorax and three posterior tracheal tears. There were 5 (3.1%) minor complications: one posterior mucosal disruption, one subcutaneous bleeding episode and three episodes of cellulitis. 137 patients (84.6%) were discharged home. Twenty-nine patients (21.2%) were followed-up and did not experience significant complications with the technique.

Clinical conclusions
Bedside percutaneous tracheostomy with bronchoscopic guidance was safe as compared with the standard of choice.

Outcomes assessed in the review
The outcome assessed in the review was the rate of complications with the traditional standard tracheostomy.

Study designs and other criteria for inclusion in the review
Not stated by the authors, although one controlled trial was referred to in the paper.

Sources searched to identify primary studies
Not stated.

Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
Eight studies were included.

Methods of combining primary studies
Not combined.

Investigation of differences between primary studies
Not stated.

Results of the review
The complication rate from standard tracheostomy ranged from 1% to 15%.

Measure of benefits used in the economic analysis
The measure of benefits used in the economic analysis was complications avoided.
Direct costs
Although no cost discounting was reported, its relevance can not be assessed since the duration of the costs included in the analysis was not explicitly stated. Quantities of resource use and costs were not reported separately. Hospital costs (converted from data on charges) included in the analysis were the prevalent costs for operating room time and equipment, and professional fees in the study hospital. The price date was not stated. The operating surgeon's fee was reported as being similar to that for open tracheostomy, whilst no additional professional fees for bronchoscopy were charged to the patients.

Currency
US dollars ($).

Estimated benefits used in the economic analysis
The intervention was associated with 2.5% major complications and 3.1% minor complications while at hospital, whilst follow-up did not show any significant complications with the technique. The comparator, the standard treatment, was associated with a 1-15% rate of complications.

Cost results
Compared with standard open tracheostomy, the savings in patient charges for the bedside percutaneous tracheostomy was approximately $1,628.20 per patient. Total saving was $263,768.40.

Synthesis of costs and benefits
A synthesis was not undertaken by the authors since the intervention was the dominant strategy.

Authors' conclusions
Bedside percutaneous tracheostomy with bronchoscopic control is a safe and cost-effective procedure in critically ill patients.

CRD COMMENTARY - Selection of comparators
The comparator chosen was the standard open tracheostomy, which was reported as the traditional method in use.

Validity of estimate of measure of benefit
Given the lack of control group in the effectiveness study, the internal validity of the study is questionable. As for the analysis of safety, the study did not provide adequate details on the methodology used in the review of the literature, leading to the estimate of the complication rate associated with the comparator.

Validity of estimate of costs
Lack of information on the costing methodology used (i.e. cost sources, categories of costs, price used) in the analysis makes it difficult to assess the validity of the corresponding estimates. Given the lack of information on the duration of costs, it is not clear whether cost discounting is a relevant issue in the present study.

Other issues
The generalisability of the results of the study may be difficult given the overall lack of information provided.

Implications of the study
Further controlled studies are needed in order to validate the study results reported herein regarding the cost-effectiveness of bedside percutaneous tracheostomy with bronchoscopic guidance in critically ill patients.

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