Prospective randomized trial of talc slurry vs bleomycin in pleurodesis for symptomatic malignant pleural effusions

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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
Chemical pleurodesis with talc slurry or bleomycin via bedside thoracostomy in patients with symptomatic malignant pleural effusions.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with malignant pulmonary disease with associated malignant pleural effusion, and some of them suffering from dyspnea, often with cough and chest pain, from malignant pleural effusion and this occurring most commonly with lung, breast, and ovarian cancer and lymphoma.

Setting
Hospital. The economic study was carried out in Seattle, USA.

Dates to which data relate
Patients were enrolled in the effectiveness study from July 1992 to the end of March 1995 and followed for up to 8 months thereafter, i.e. until November 1995. Dates for costing and prices were not given.

Source of effectiveness data
Evidence for final outcomes was based on a single study.

Link between effectiveness and cost data
It was not stated whether the costing was based on the same patient sample as in the effectiveness analysis nor whether it was collected prospectively or retrospectively.

Study sample
Inclusion criteria were documentation of a malignant pleural effusion and a life expectancy greater than 1 month. Patients were excluded if they had significant loculated effusions or trapped lung after drainage. It was not stated whether power calculations determined sample size. The methods of sample selection were not explained. Initial numbers in each group were not given, only numbers of procedures available for follow up. 33 procedures were available for study, 14 in the bleomycin group and 19 in the talc group. 6 patients who underwent 7 procedures were
excluded from the analysis after randomisation.

**Study design**
This was a single centred, randomised controlled trial (blinding was not mentioned). The unit of randomisation was the procedure, randomisation being carried out by the investigational pharmacy. Follow-up ranged from 2 weeks to 8 months (mean 1.7 months). The unit of study was not clear. It was stated that 35 patients were randomised into intervention and comparator groups but each procedure appears to be the unit of study. Each effusion was randomised separately, rather than each patient, as 3 patients had bilateral effusion: one received bleomycin bilaterally while 2 patients had different treatments on each side. The latter were both included as individual procedures, total 40 procedures. Loss to follow up was 7 procedures in 6 patients (17.5%). Percentages in each group were not given. 1 patient with bilateral effusions (different treatments each side) was lost to follow up because of unrelated death and the remaining 5 were unavailable for follow-up for unexplained reasons.

**Analysis of effectiveness**
The analysis was based on treatment completers only. Primary health outcomes were as follows.

(1) Post-treatment effusion measured by chest radiograph. Scores were: no effusion, 1; minimal effusion, 2; moderate, 3; and large effusion, 4 (50 - 99% compared to before treatment).

(2) Pain; and

(3) dyspnea measured by direct patient contact and observations from primary care, hospice and nursing home physicians.

Adverse effects looked for were wound infections, respiratory failure and death due to pleurodesis. Groups were comparable in terms of age, sex, side of pleurodesis, and number of hospital days (p-values all non significant). Pathology was dissimilar in that none of the bleomycin group had breast cancer but it was not stated whether this was statistically significant. No adjustment was made.

**Effectiveness results**
A chest radiograph score of 1 or 2 was achieved by 79% in the bleomycin group and 90% in the talc group, (p=0.338). There was 1 significant recurrence in the bleomycin group, radiograph score 4, subsequently treated with talc. Pain scores were 4.1 before and 2.4 after in the bleomycin group and 5.9 before and 3.1 after in the talc group, (differences not significant). Dyspnea scores were 2.9 before and 2.0 after in the bleomycin group and 3.3 before and 1.9 after in the talc group, (differences not significant). Significant complications were 3 limited wound infections in the talc group and none in the comparator, (p=0.119). There were no cases of respiratory failure and no deaths directly attributable to pleurodesis.

**Clinical conclusions**
Both groups improved in terms of pain and dyspnea following treatment. There were no significant differences between groups in permanent control of effusions and no significant adverse effects were observed.

**Measure of benefits used in the economic analysis**
The authors concluded that there was no difference in effectiveness between the intervention and comparator and the economic analysis was based on the difference in costs only.

**Direct costs**
Quantities and costs were not analysed separately. Discounting was not relevant. The medication cost to the centre for each treatment was given, the cost boundary was therefore the institution. No other cost details were given. The price
date was not mentioned.

**Statistical analysis of costs**
Costs were not analysed stochastically.

**Indirect Costs**
Not considered.

**Currency**
US dollars ($).

**Sensitivity analysis**
None performed.

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

**Cost results**
The medication cost to the centre was $955.83 for each treatment with bleomycin and $12.36 for each treatment with talc.

**Synthesis of costs and benefits**
Not applicable.

**Authors' conclusions**
Since there is similar efficacy and significant cost advantage, talc should be the agent of choice when using pleurodesis to control symptomatic malignant pleural effusions.

**CRD COMMENTARY - Selection of comparators**
The reasons for the choice of comparator were clearly given.

**Validity of estimate of measure of benefit**
The numbers involved in this study may have been too small to measure differences in benefit or side effects. The clinical conclusions are not likely to be internally valid. The unit of study was not clearly expressed and the numbers initially randomised to each group were not given.

**Validity of estimate of costs**
Not enough detail was given of costs or prices. It is not clear that all relevant costs were included. The cost of the repeat treatment should have been added to the cost of the failed treatment not counted separately.

**Other issues**
With respect to the small sample size, the lack of details, and absence of statistical analysis or sensitivity analysis of the costs, the results of the study should be treated with some caution. The issue of generalisability to other settings or
countries was not addressed. Appropriate comparisons were made with other studies.

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