Randomized controlled trial and cost-effectiveness analysis of silver-donating antimicrobial dressings for venous leg ulcers (VULCAN trial)

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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.

CRD summary
This study examined the cost-effectiveness of silver-donating versus non-silver low-adherence dressings in the treatment of venous leg ulcers. The authors concluded that the two dressings were similar in their clinical impact and there was no evidence to support the routine use of silver-donating dressings beneath compression for venous ulceration. The methodology appears to have been valid, which enhances the validity of the authors’ conclusions.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to examine the cost-effectiveness of silver-donating versus non-silver low-adherence dressings in the treatment of venous leg ulcers.

Interventions
The two strategies were silver-donating antimicrobial dressings versus non-silver dressings, which included any non-antimicrobial low-adherence dressing.

Location/setting
UK/primary care.

Methods
Analytical approach:
The analysis was based on a single study with a 12-week time horizon. The authors stated that the study was conducted from the perspective of the UK National Health Service (NHS) and Social Services.

Effectiveness data:
The clinical evidence came from a multi-centre randomised controlled trial (RCT), which recruited from two areas in England, between March 2005 and November 2007, patients with an active ulceration of the lower leg for longer than six weeks. The exclusion criteria and details of the randomisation procedure were reported. The sample included 213 patients with 107 (mean age 68.8 years; 53 women) randomised to the silver-donating group and 106 (mean age 72.4 years; 62 women) randomised to the non-silver group. The maximum follow-up was one year. The primary outcome measure was the proportion of patients who had an ulcer in the index leg that had healed completely at 12 weeks.

Monetary benefit and utility valuations:
The utility values were obtained from patients in the RCT at baseline, one, three and 12 months, using both the European Quality of life (EQ-5D) and the Short Form 36 (SF-36) health survey questionnaires.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure and were calculated from the two measures for the derivation of health-related quality of life; the EQ-5D and the SF-6D, which was generated from the SF-36 data. Both of these were derived from the RCT.

Cost data:
The economic analysis included clinic visits, which included the number of dressings and bandages used as both were changed at each visit, community nurse home visits, general practitioner contacts, and chiropody contacts. The resource use data were derived from a subsample of patients in the RCT with complete data. The sources for the costs were not reported. All costs were in UK pounds sterling (£) and the price year was 2007.

Analysis of uncertainty:
The uncertainty surrounding the cost-utility ratios was investigated by means of non-parametric bootstrapping and this provided cost-effectiveness acceptability curves.

Results
No statistically significant differences were found between the two groups in any outcome (healed ulcer, time to healing, recurrence rate, and quality of life).

The mean total cost per patient was £417.97 (95% CI 375.01 to 460.93) in the silver group and £320.12 (95% CI 277.42 to 362.82) in the control group.

The mean QALYs (calculated using the EQ-5D) gained with silver dressing were 0.0002, resulting in an incremental cost per QALY gained with silver dressing of £489,250.

The probability that silver dressing was cost-effective at a threshold of £10,000 per QALY was 0.37, at £30,000 it was 0.40, and at £50,000 it was 0.40.

Similar results were achieved when SF-6D data were used and when different imputation methods for missing values were used.

Authors’ conclusions
The authors concluded that the two dressings were similar in their clinical impact and there was no evidence to support the routine use of silver-donating dressings beneath compression for venous ulceration.

CRD commentary
Interventions:
The selection of the two comparators was appropriate. The authors stated that the trial was pragmatic and the management of leg ulcers was carried out in accordance with the normal practice. The choice of the compression bandage was based on local practice. All silver-donating dressings available in the authors' setting were reported. The typical non-silver dressing was any non-antimicrobial low-adherence dressing from any manufacturer.

effectiveness/benefits:
The use of a RCT should have ensured the validity of the clinical analysis due its randomisation procedure, which should have minimised the impact of selection bias and confounding factors. The sample size was justified on the grounds of power calculations, the details of which were clearly reported, but the study was only powered to detect statistically significant differences in the healing rate, which was the primary endpoint. Strengths of the analysis were the use of the intention-to-treat principle, the multi-centre design, and the baseline comparability of study groups with respect to most of the clinical and demographic characteristics. In general, the clinical analysis was well conducted and reported. The authors noted some potential limitations, such as the differences found in the clinical results between the two areas where the study took place. The derivation of utility values used to calculate the QALYs was clearly presented. Two approaches were used and neither of them demonstrated a statistically significant superior profile for silver dressings. The assessment of the potential factors affecting quality of life was investigated in a regression analysis, the key details of which were reported. The authors highlighted the difficulties of measuring quality of life in patients with leg ulcers and pointed out the need for a specific measure of quality of life for this patient population, who often suffer from co-morbidities.

costs:
Extensive details of the economic analysis were presented in a separate report. In general, the cost categories were consistent with the economic viewpoint, but the unit costs and their sources were not reported. The data on the patient
sample used to derive the information on patterns of resource consumption were provided, and the methods used to deal with missing values were reported. Standard statistical tests were used to detect differences in the costs between the two groups. The price year was reported, which will allow reflation exercises to be carried out in other time periods.

**Analysis and results:**
The incremental approach used to synthesise the costs and benefits was appropriate. The results were clearly presented and discussed. The issue of uncertainty was appropriately investigated using a valid approach. The authors stated that a detailed description of the methods and of the cost-effectiveness modelling was presented in a separate report, which should also contain more details on the cost data.

**Concluding remarks:**
The methodology appears to have been valid, which enhances the validity of the authors’ conclusions.

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