Clinical and economic benefit of enzymatic debridement of pressure ulcers compared to autolytic debridement with a hydrogel dressing
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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 aimed to assess the cost-effectiveness of collagenase enzymatic debridement, compared with hydrogel autolytic debridement, for the treatment of pressure ulcers. The authors concluded that collagenase ointment was cost-effective compared with hydrogel autolysis. The methods appear to have been appropriate, but the method of randomisation and the initial characteristics of the group were not reported, raising some uncertainty that all the benefits achieved were due to the collagenase ointment.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study aimed to assess the cost-effectiveness of collagenase enzymatic debridement, compared with hydrogel autolytic debridement, for the treatment of pressure ulcers.

Interventions
Collagenase enzymatic debridement was compared with hydrogel autolytic debridement. All dressings were changed daily and covered with a standard semi-occlusive dressing.

Location/setting
USA/residential care (nursing home).

Methods
Analytical approach:
The cost-effectiveness analysis was based on one clinical study. A three-state Markov model was used to capture the dynamic nature of wound healing and to project the clinical outcomes beyond the end of the trial, assuming constant transition rates. The time horizon was one year. The study perspective was stated to be that of the long-term care facility.

Effectiveness data:
The primary clinical outcomes were the proportions of patients whose wounds were completely debrided at 42 and 84 days. The randomised trial had two phases: up to 42 days, and up to 84 days. This supplied the probabilities for transition from inflammation to proliferation, and from proliferation to epithelialised. It was conducted at a centre for long-term care and included 27 patients with stage three or four pressure ulcers that had 85% or more of necrotic non-viable tissue. Two investigators, who were blind to allocation, measured the outcomes.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The measure of benefit was the number of epithelialised days, which was the expected number of days that the wound was closed, over one year.

Cost data:
The analysis included the costs of nursing time, collagenase ointment, hydrogel dressing, secondary semi-occlusive dressings, wound irrigation, and wound care kits. The resource use estimates came mostly from the trial, but also from the lead clinical investigator and the literature. The costs were reported in US $. The price year was 2012.

Analysis of uncertainty:
One-way sensitivity analyses were conducted on all model parameters, varying most values by ±20%. A scenario was analysed in which the frequency of dressing changes for hydrogel was reduced from daily to once every three days.

Results
The number of expected epithelialised days was 317 for the collagenase group, and 218 for the hydrogel group.

The expected cost per pressure ulcer was $2,003 for the collagenase group, and $5,480 for the hydrogel group.

The sensitivity analyses demonstrated that collagenase was more effective and less costly than hydrogel in every case.

Authors' conclusions
The authors concluded that collagenase ointment was cost-effective compared with hydrogel autolysis.

CRD commentary
Interventions:
The authors justified their selection of interventions, and they appear to have been used in current practice at the time.

Effectiveness/benefits:
The clinical trial was randomised, but the method of randomisation was not reported. The sample was small and no comparison of initial patient and wound characteristics was presented. So, it is possible that confounding factors influenced the results. The trial investigators who measured the outcomes were appropriately blinded. The authors justified their one-year time horizon as sufficient time for wound closure.

Costs:
Appropriate costs appear to have been included from the institution's perspective. The authors made a significant resource use assumption for the frequency of dressing changes for hydrogel, and an alternative was appropriately assessed in the sensitivity analysis. The unit costs were reported and were from standard sources, but these were not referenced in the text. Discounting was unnecessary for both benefits and costs due to the short time horizon.

Analysis and results:
The analysis was adequately reported and conducted. No uncertainty around the cost-effectiveness estimate was presented. The analysis was driven by the effectiveness of reducing the number of wound days, and the collagenase dressing showed a statistically significant improvement despite the small sample. One-way sensitivity analyses were conducted, but the rationale for varying the parameter values by ±20% was not given. The authors appropriately referenced other economic evaluations which supported the findings of this analysis.

Concluding remarks:
The methods appear to have been appropriate, but the method of randomisation and the initial characteristics of the group were not reported, raising some uncertainty that all the benefits achieved were due to the collagenase ointment.

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Bibliographic details
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