Cost-Effectiveness of PluroGel® - a new Micelle-matrix-based dressing with 1% silver sulphadiazine – in the management of non-healing wounds

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Objectives

Complex wounds present a substantial economic burden on healthcare systems, costing billions of dollars in Europe and the US. The prevalence of complex wounds is a significant patient and societal healthcare concern and cost-effective wound-care management remains unclear. The model compares the following strategies for treating wounds: venous, diabetic, arterial and mixed: PluroGel® vs. Silver-dressing, Hydrogel-dressing, Medical-honey, Impregnated-dressings and Good-wound-care (GWC). All reimbursed products, corresponding to the reimbursement rule, were considered.

Methods

To investigate the impact of using PluroGel® versus silver-dressings, hydrogel-dressings, medical-honey, impregnated-dressings and GWC a six-arm probabilistic model was developed. Markov-modeling techniques were used to estimate wound healing (=wound closure) according to wound types. The simulation included three states: Unhealed, healed and death. The model considered treatment changes and relapse. According to treatment specific healing-rates patients may move weekly from the health state “Unhealed” to the “Healed” state. The model compares the following wound care: PluroGel®: a multifunctional surfactant-based biomaterial dressing with 1% silver sulphadiazine plus GWC; Silver-dressings: alternatives with silver without foam dressing plus GWC; Hydrogel-dressings: gels for moisture balance of the wound plus GWC; Medical-honey: honey dressings with antibacterial effects plus GWC; Impregnated-dressings: each alternative with an active substance (e.g.: Ibufprofen, collagen) plus GWC; GWC: contains all alternatives with no active substance and compression bandages plus GWC.

This research utilized the outcomes data of a published 1,036 patient, 10-center clinical-study for PluroGel®. Healing-rates were derived from a systematic literature review from the medical literature for all wound types and comparators. A 1-year horizon was incorporated to determine the number of ulcer-free weeks and the expected costs of therapies. Cost data represent direct medical costs in 2017 € for Austria. The payer’s perspective was adopted and only direct costs of care were considered. Sensitivity analyses were performed to gauge model parameter uncertainty.

Clinical Data

Healing rates, defined as wound closure, for the selected comparators were determined by the systematic literature research. Data out of 7 clinical trials (Palombo 2016, Michaels, 2009, Kittka 1988, Bevis 2011, Juli 2008, Graumlich 2003, Mostov 2005) were used for calculation.

Resource Use and Costs

Data on the resource use of wound healing procedure was collected in two steps. First, the medical resources were derived by literature and wound expert opinions. In a second step this literature review was transferred to the Austrian setting. The following direct medical costs were included:

- Dressing costs
- Physician consultation costs
- Hospitalization costs
- Laboratory and investigation costs,
- Dressing and skin graft costs,
- Medication costs and in-patient costs

Austrian costs were derived from a number of publicly available sources like the DRG catalogue (LKF), from Austrian price lists and tariff catalogues and the Austrian official drug price list (Warenverzeichnis). When necessary, prices were adjusted to 2017 prices using the consumer price index.

Results

In all wound types PluroGel® is associated with the lowest costs. In venous wounds PluroGel® total costs amount to 3,771 € (silver-dressings: 4,644 €; hydrogel-dressings: 4,538 €; medical-honey: 4,676 €; impregnated-dressings: 4,324 €; GWC: 6,764 €). Total cost for other wound types were displayed in Table 2. Markov-modeling techniques were used to estimate wound healing (=wound closure) according to wound types. The simulation included three states: Unhealed, healed and death. The model considered treatment changes and relapse. According to treatment specific healing-rates patients may move weekly from the health state “Unhealed” to the “Healed” state.

Conclusion

From the Austrian health-care-systems perspective PluroGel® is the most cost-effective wound care product and yield potential cost-savings.

References

