Silver-containing Dressings: Availability Concerns

Professor Richard White
University of Worcester, UK

Clinicians in the UK and much of Europe have enjoyed ready access to the wide spectrum of available wound dressings for many years. However, economic pressures and lack of evidence have been cited as the reasons for recent restrictions on modern wound dressings — notably, those containing the antimicrobial silver — particularly in the UK. This has created frustration and confusion among clinicians and manufacturers, the former forced to vigorously defend clinical practices.

What precipitated the change? Importantly, the available evidence supporting silver dressing use is sufficient for the major European Union regulatory bodies, including the Medicines and Healthcare Products Regulatory Agency (MHRA) in the UK (according to the European Medical Device directives 93/42/EEC), to bestow key “CE” marking approval. However, recent publications, including some systematic reviews,1-4 have cast enough doubt on the quality of the available evidence to give purchasers the necessary rationale to restrict product availability. But because reviews can be contradictory,5 can we assume they are drawing accurate conclusions?

There can be no reasonable doubt that silver, in vitro, is a proven broad-spectrum antimicrobial active against a wide range of pathogens, including resistant organisms such as methicillin-resistant Staphylococcus aureus (MRSA).6-8. In vivo, numerous level 1 and level 2 studies and one meta-analysis demonstrate efficacy in burns.8-11 Twenty studies in which silver dressings have been shown to be effective in leg ulcers or diabetic foot ulcers have been identified. Although Cochrane reviews claim evidence supporting the use of these dressings is insufficient, the most recent review2 acknowledges 26 random controlled trials (RCTs) incorporating 2,066 patients with positive results. Thus, it can be argued that silver dressings have the requisite evidence to support their use.

It is important that dressings containing silver be used exclusively in cases where clinical signs of infection are present or where a patient has been identified as at substantial risk of infection. The VULCAN Trial publication1 has been cited as the scientific rationale for removing silver dressings from wound formularies, based on a demonstrated lack of healing efficacy. However, serious methodological flaws in this study have been highlighted12 — eg, silver dressings were used for prolonged periods of time (up to 12 weeks) without clinical justification, contrary to current best practice.14-16 The authors seek to draw conclusions from the outcomes observed from inappropriate silver dressing use, fostering the misconception that silver-containing dressings performed in a similar manner to less expensive non-silver dressings. Given that the authors confirm in their report that the wounds treated with silver were “not infected,” this undermines the scientific value of the finding that silver dressings did not perform clinically.

It is my contention that silver dressings must be used per manufacturer instructions — ie, in the presence of local infection or critical colonization — in order to be accurately assessed. Guidelines dictate that silver dressings must be used in an appropriate and structured manner for short periods, with clear clinical objectives in mind.13-16 This was not the stated case in the VULCAN Study, nor is it as yet a universally accepted clinical practice. To address the latter issue, a Best Practice Statement in the use of Topical Antimicrobials/Antiseptics (www.wounds-uk.com/index.shtml) has been drafted by a panel of experts in the field and is currently out for consultation. It states that products such as silver wound dressings should be used in a timely and appropriate manner which is tied to accurate assessment and regular reassessment. This is a responsible attempt by persons active in wound healing to address concerns that have been raised regarding silver dressing use. Best Practice Statement contributors are mindful of potential catastrophe regarding vulnerable patients denied access to silver dressings. Although it is acknowledged that not all silver dressings are equally effective and that more clinical evidence is required, no other topical antimicrobial has more supporting evidence than silver.

Withdrawing silver without adequate justification, clinical advice, or effective alternatives will compromise care and increase morbidity and mortality. The latter has been established through audit and shows that the arbitrary withdrawal of silver has led to increased incidence of septicemia and death.7 Those responsible for wound formularies should be mindful of the potential human costs associated with decisions based on poor science and that, in the event of a documented increase in septicemia, such persons should be held professionally accountable. Responsible clinicians will continue...
to seek to use silver dressings as part of a coordinated and comprehensive approach to reducing infection rates.\textsuperscript{17–20} The risks associated with arbitrary restrictions or removal of antimicrobial products should be borne in mind by all who have responsibility for the prevention and management of wound infection.

### References

5. Lo SF. Antimicrobial silver dressings beneath compression for venous ulceration are not cost-effective compared with standard dressings. Evid Based Nurs. 2010;Jun 8 [Epub ahead of print].

### Commentary

**Are silver dressings useful?**

Michel H.E. Hermans, MD

Hermans Consulting Inc.

Newtown, PA

Prof. White notes that as with all antimicrobials, silver dressings must be used in an appropriate and structured manner for limited periods. A clinician should be able to give a sound reason why any dressing or technique is used, not used, continued, or discontinued in each specific lesion in each specific patient. Different types of wounds in different patients require different dressings and other measures during each stage of the wound healing process. After all, a venous leg ulcer in an elderly patient with cardiac failure and severe peripheral edema is very different from a 5% total body surface area (TBSA), superficial, partial-thickness burn in a healthy 20 year old and from a Stage II pressure ulcer in a face area (TBSA), superficial, partial-thickness burn in a peripheral edema.

In addition, dressings and materials cannot necessarily be compared, even although they may contain the same primary compound — eg, not all dressings containing silver release the same amount of Ag ions.\textsuperscript{1,2} Varying silver concentrations and differing modes of silver ion delivery render direct dressing comparison inappropriate.\textsuperscript{3} Silver products such as silver sulfadiazine creams and silver nitrate solutions have side effects that can be both topical (eg, the formation of pseudo-eschar that makes judging the wound difficult)\textsuperscript{4} or systemic (eg, methemoglobinemia development and/or electrolyte imbalance).\textsuperscript{5} Such side effects are not linked to the silver per se but to the negative complex (NO\textsubscript{3}\textsuperscript{−}; sulfadiazine) with which the silver forms a salt.

Still, there is a general tendency to not consider pharmacological and physical differences among wounds when conclusions are drawn on a group of materials that seem superficially to be similar. Results of a trial\textsuperscript{6} of one specific type of silver dressing used in venous leg ulcers are sometimes used or quoted as “overall proof” that silver lacks efficacy in general and outcomes with one material in one indication often are used to justify (not) using a “similar” material, sometimes even for a entirely different indication.

Moreover, healing differences may not always be the only important outcome in a trial. Everything else being equal, pain reduction might be a driver for using a specific (silver or other) material. Also, a dressing might be more expensive per se but it may help in reducing overall cost of care by reducing the number of dressing changes and subsequent nursing costs,\textsuperscript{7} making cost control an important outcome.

Prophylactic use of a certain type of silver dressing may not be necessary for most ulcers, but in burn care topical agents (most commonly silver-containing materials) are virtually always used in burns exceeding 20% to 30% TBSA because patients with larger burns run a serious risk of wound infection and its sequelae, sepsis and death. Although prophylaxis is virtually impossible to study in a randomized, controlled trial (RTC), and, as such, does not appear in reviews such as Cochrane’s, silver creams and dressings are important in burns.

As is the case with many other dressings and wound therapies, a large number of publications on silver-containing dressings is not based on true RTCs. Therefore, by some standards very little proof exists of the clinical efficacy of silver dressings and dressings in general, at least in the purely scientific sense of the word proof. However, one needs to realize that true level 1 RTCs are virtually impossible to perform in wound care — the number of patients is too small and the number of variables so large that inclusion and exclusion criteria would lead to a level of stratification in which statistically relevant numbers per stratum are difficult to reach. However, many trials (not case histories) with lower levels of evidence exist for many silver-containing materials and dressings and although this is not level 1 evidence, it certainly does not mean that dressings in general, and silver dressings in particular, have no merit.

We need to be alert to flaws in the evidence. A certain amount of skepticism is always good when reading clinical (negative and positive) results. It is also important that results should not be extrapolated from one material to another, even when they are both in the same group.

Indiscriminate use of any material is not appropriate and product choice should be based on published scientific evidence. In that context, to come back to the original question: yes, silver dressings are certainly useful when used properly.

References
1. Ovington LG. The truth about silver. Ostomy Wound Manage 2004;50(9 suppl A):1S-10S.