

Efficacy of a 0.01% silver nitrate solution used for wound irrigation



Johnson-Arbor K Department of Emergency Medicine and Traumatology Wound Healing and Hyperbaric Medicine Center Hartford Hospital; Hartford, CT

Background:

- Normal Saline (NS) is commonly used for irrigation of chronic wounds.
- Other irrigation solutions are available, but there is limited evidence supporting their clinical effectiveness.¹
- We sought to investigate the efficacy of a topical wound irrigation product containing 0.01% silver nitrate solution (SNS).²

Methods:

- The study methodology was approved by the hospital's IRB.
- Four adult patients who had venous leg ulcers (VLU) with slough tissue present and who made twice weekly visits to our outpatient wound center (OWC) were enrolled.
 - 3 females, 1 male
 - Average patient age was 59 years old (range 45-79 years old)
 - All ulcers were chronic (average duration of 41 months' presence (range 9-97 months)
- At each OWC visit, the VLU was irrigated with 35-50 cc of 0.01% SNS using a 35 cc syringe; then a piece of 0.01% SNS-soaked gauze was applied to the wound for ten minutes.
- Traditional wound care products (topical antimicrobial agents and compression therapy) were then applied to the VLU as per the treating physician's order.
- Outcome measures included total wound area measurements and the amounts of slough and/or granulation tissue present.
- Patients and OWC staff were also asked to note whether pain or other adverse events occurred.



Prior to treatment with 0.01% SNS, this VLU had 25% slough tissue and 75% granulation tissue present. Wound (which had been present for 97 months) area measured 20.1 cm².



After four applications of 0.01% SNS to the wound, the VLU had no visible slough tissue present. The wound was assessed as having 75% granulation tissue and 25% epithelial tissue present. Wound area was 14.9 cm² (a 25.9% decrease in wound area).

Results:

- Three of the four patients experienced decreases in total wound area.
 - Wound areas decreased by an average of 47% (range 25.9%-88.5%)
- All patients enrolled were found to have a subjective increase in granulation tissue and a reduction in the amount of slough tissue in their wounds.
- The reduction in slough tissue translated into a decreased need for sharp debridements.
- Subjective reductions in wound odor and periwound erythema were also noted.
- Wound irrigation with 0.01% SNS was associated with only mild side effects such as pruritis and a mild-to-moderate burning sensation.
- Argyria was not reported to occur.

Discussion:

- The mechanical debridement effect of the 0.01% SNS-soaked gauze on the wounds may have contributed to the reduction in slough tissue.
- Several patients reported that the burning sensation associated with the use of 0.01% SNS was minimal compared with the sensations they experienced after use of ¼-strength Dakins' solution for wound irrigation.

Conclusion:

- 0.01% SNS appears to be a reasonable alternative to NS as a wound irrigation agent.
- The use of 0.01% SNS is associated with a reduction in wound slough tissue and a decreased need for sharp debridement.
- Adverse events are minimal after use of 0.01% SNS for irrigation of sloughy VLU's.

¹ Horrocks A. Prontosan wound irrigation and gel: management of chronic wounds. British Journal of Nursing 2006;15(22):1222-1228.

² SilverStream® by EnzySurge, Ltd

This research was funded by Extera Partners, LLC on behalf of EnzySurge, LTD.