Shifting focus: implications of periwound bacterial load on wound hygiene

Rosemary Hill BSN CWOCN CETF (C), Joshua Douglas MD, FRCPC, ABIM
Infectious Disease and Critical Care Internal Medicine, Vancouver Coastal Health

INTRODUCTION

- Wound cleansing is the most ubiquitous method to maintain optimal wound hygiene as it is available at all clinical settings and skill levels.
- The periwound is often a neglected area, but serves as a source for microbial recontamination if not adequately cleansed.
- Fluorescence imaging has been used to visualize fluorescing bacteria in real-time at the bedside using a non-contact device. This study reports the use of bacterial fluorescence imaging to assess bioburden in the wound and periwound area to optimize wound hygiene using a new cleansing agent, using lower concentration sodium hypochlorite (NaOCl), compared to standard practice.

METHODS

Bacterial Fluorescence Imaging

- When excited by 405 nm violet light, tissues fluoresce green while bacteria fluorescence red (e.g. Staphylococcus aureus) or cyan (e.g. Pseudomonas aeruginosa).
- This enables real-time, point-of-care detection and localization of bioburden (≥ 10⁴ CFU/g) within and around wounds.

RESULTS

Visualization of bacterial load can be incorporated into routine wound care to optimize wound hygiene by guiding targeted cleansing.

Case 1: 72 year old male treated with NPWT after midline surgery complication
- Distinct odour observed at the time of assessment
- Swab obtained from the wound bed prior to fluorescence imaging were negative for bacterial growth
- Red fluorescence indicates presence of bacteria

Case 2: Skin Tear
- Saline cleanse was moderately effective in removing red fluorescent bacteria
- NaOCl cleanse successfully removed red fluorescent bacteria

Case 3: DFU
- Red fluorescing bacteria present at the wound bed and periwound site
- Saline cleanse did not eradicate fluorescent bacteria
- NaOCl cleanse successfully removed all red fluorescence

Case 4: VLU with necrosis
- Cleansing with saline did not remove cyan or red fluorescing bacteria
- NaOCl was very effective on cyan fluorescing bacteria
- Red fluorescence remained after NaOCl cleanse and the patient required debridement

REFERENCES

4. DaCosta RS et al. Point-of-care fluorescence imaging positively predicts the presence of pathogenic bacteria in wounds in 10/10 wounds compared to 3/10 wounds (p < 0.001) of wound care patients. 2016.

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