New Wound Gel for Favorable Treatment of Second Degree Facial Burn Wounds

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Background

- Standard of care for second degree burns under 15% TBSA in most burn centers and emergency rooms in the US is Topical Antibiotic ointment with non-adherent gauze and daily dressing change
- Why? Readily available
- We continue to use topical antibiotics for (minor)Burn injuries because: Burns get infected easily? We feel better about sending patients home with them? Because advertisement tells us they are “for minor cuts and burns”?

We know better!

- We have a multi drug resistant bacteria epidemic, especially affecting Pseudomonas and Staphylococcus and topical antibiotics are part of the cause[1,2]
- Other problems with antibiotic ointment and gauz: Ointments are greasy and smear into clothes/bedding; Gauze for cover causes claustrophobia in a lot of patients; Requires VERY frequent re-application; Should not get into eyes or onto mucous membranes

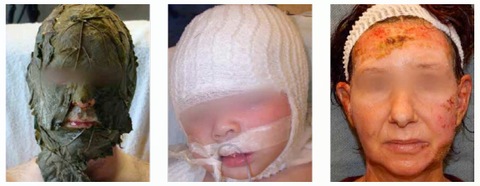
So we considered a different approach:

- Prontosan GelX PHMB gel is a new product for burn treatment. The bactericidal properties of PHMB have been demonstrated against a range of species, follow first order kinetics and have been observed within one hour at concentrations below 10 µg/mL Also, its high therapeutic index has long been attributed to the polymer having comparatively less activity against mammalian membranes6. The prevailing model for PHMB’s microbe-selective toxicity holds that PHMB disrupts microbial membranes preferentially. However, this model relies on data from artificial membrane studies and it does not explain how PHMB is able to kill diverse microbes, which differ in cell barrier composition, nor does it explain observations that PHMB can induce DNA repair pathways. Therefore, the literature contains conflicting evidence and interpretations regarding the antibacterial mechanism of action of PHMB. When considering the membrane disruption model and possible alternatives, it may be important to recognize that PHMB has a capacity for both electrostatic and H-bonding interactions, which could occur at many possible targets in cells. For example, PHMB binding to nucleic acid has been demonstrated in vitro, raising at least one possible alternative mechanism of action.[3]

This case series represents a different approach to our patients with face burns, because we are generally not happy with our standard of care and encounter the same issues repeatedly: drying out of nose, ears and eyelids with deepenig of the injury and prolonged healing.

Face burn Injuries – an unsolved problem

- Face burns are extremely common
- Most face burns heal, even when deep dermal, with local wound care
- Standard local wound care consists of antibiotic creams
- The tip of the nose, the ears and the eyelids regularly dry out
- Drying out of the burn wound leads to deeper injury and scarring
- Treatment options range from B&W ointment with leaves to complete head wrap to open and dry:



Case 1: 49 y/o male, 15% TBSA 2nd degree burns face, BLUE, BLLE from accelerant (gasoline on wood); healed in 10 days;

Case 2: 58 y/o male, 6% TBSA 2nd degree burns face, BLUE, right LE from hot oil spill/ spray at work; healed in 13 days;

Case 3: 67 y/o female, 2% TBSA 2nd degree face and neck from cooking accident; healed in 15 days

Permission to use photographs for publication was obtained from all patients.

Patient comments

- All were satisfied
- Most patients applied the gel <8 times a day to keep moist
- Most patients applied more gel because it “made the burn feel better”
  - “It felt a lot better with it on”
  - “Initially I felt some stinging but that went away and then it made it feel much better”
  - “It stayed on well”
  - “It felt better than the antibiotic ointment I used on my hands; it has a cooling effect that the antibiotic ointment does not have.”
  - “I kept on applying it because it made it feel so much better!”

Conclusion

- The gel application kept the problem areas on the face (nose, ears and eyelids) covered and moist
- Patients felt like the gel improved their pain and discomfort
- Patients healed within normal standards for face burns
- There were no adverse effects noted besides a slight stinging sensation upon the first few applications (due to water based ph difference)

Disclosures: Product for this study was provided by B. Braun Medical Inc.

REFERENCES

[1] Biggest Threats and Data 2019 AR Threats Report CDC’s Antibiotic Resistance Threats in the United States, 2019(2019 AR Threats Report)

[2] Purnima Kumar, in Pharmacology and Therapeutics for Dentistry (Seventh Edition), 2017 Bacitracin

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