Successful Treatment of Neonatal Ischemic Injuries Using Active *Leptospermum* Honey

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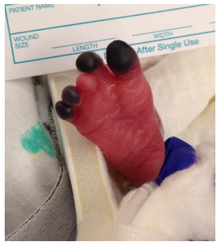
Introduction

Premature infants often suffer severe ischemic-related wounds as a result of complications from vascular arterial catheters. These injuries are difficult to treat and the traditional approach towards these wounds has been supportive and observational alone.

Active *Leptospermum* Honey (ALH)* has been illustrated to be safe and effective in neonatal extravasation wounds1,2.

It was the author's hypothesis that ALH could:

- expedite safe and effective autolytic debridement of ischemic tissue
- prepare a healthy wound bed for final closure and healing.
- reduce the risk of additional limb damage in these fragile patients.
- Four cases are presented to illustrate outcome.



Clinical Challenges

The traditional approach to treating ischemic injuries of the extremities has been observational and supportive at best. In the author's experience, surgical colleagues would recommend minimal active treatment and allow autolytic necrosis of nonviable tissue and bone to take place. Parents and NICU staff would often be faced with watching a hand or foot degrade over weeks as digits and sections of the extremities eventually separated from healthy tissue. In many cases, secondary infection would arise resulting in additional tissue injury and loss of limb. These complications would impede interventions designed to reduce permanent long-term mobility and use of the hands and feet,

Treatment goals from ALH were to expedite autolytic debridement and help salvage residual tissue from further damage.

Active Leptospermum Honey

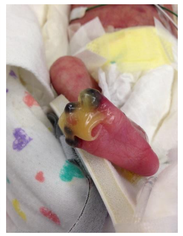
- Supports removal of necrotic tissue and aids in wound healing via autolytic debridement.
- Osmotic potential draws fluid through the wound to the surface, helping to liquefy non-viable tissue
- Low pH of 3.5-4.5 - maintaining more acidic pH levels promoting an ideal wound healing environment.
- Maintains effectiveness even in the presence of wound fluid, blood and tissue
- Promotes a moisture-balanced environment conducive to wound healing
- Proven efficacy and safety in infants1,2

Patient Characteristics

Patient #1 – 23-week premature male who suffered an ischemic injury to the right foot on DOL 39 due to occlusion of peripheral arterial line.
Patient #2 – 23-week premature male who suffered an ischemic injury to the left distal toes on DOL 21 due to an occlusion of a peripheral arterial line.
Patient #3 – 26-week premature female who suffered an ischemic injury to the right first distal toe on DOL 35 due to occlusion of a peripheral arterial line.
Patient #4 – 27-week premature infant male who suffered a severe ischemic injury to the right foot on DOL 28 due to an occlusion of a peripheral arterial line.

Methods

All wound beds were cleaned and irrigated prior to procedure with normal saline. With each dressing change loose nonviable tissue was mechanically debrided from the affected limb. ALH gel was applied over the affected extremity and digits. ALH calcium alginate was cut to approximate the size of the injury and applied over the ALH gel. Dialkylcarbomoyl chloride (DACC)-coated mesh dressings were wrapped around the affected extremity as a secondary layer. A final layer of soft conforming gauze was used to secure all dressings in place. This procedure was repeated every 1-2 days. Once all nonviable tissue was effectively debrided. Open wounds were closed with extracellular matrix dressings or as in Pt 1 - human reticular acellular dermal matrices applied for final closure.



Results

Illustration of Wound Progression

Patient #1

Patient #2

Patient #3

Patient #4

Conclusions

This case series illustrates the following regarding application of ALH on ischemic injuries of the extremities

1. The treatment is safe in premature infants (Patients #1 & #2 were both 23-week preemies.
2. Effective towards autolytic debridement of nonviable tissue affected by the ischemic injury.
3. Expedited debridement of nonviable tissue versus traditional observation alone which allow for faster granulation and wound closure.
4. Promoted a clean wound environment reducing risk for infection and additional tissue injury.

This technique is now standard among all NICU wound care consults when addressing ischemic injuries of the extremities.

Bibliography

1. Amaya R. Safety and efficacy of active Leptospermum honey in neonatal and paediatric wound debridement. J Wound Care 2015;24:95-103.

2. Amaya, RA. (2022). 'Honey and Pediatric Wound Care' in Ciprandi, G.(ed.) Neonatal and Pediatric Wound Care. Torino: Edizioni Minerva Medica, pp. 204-218.

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