Experience Using a Neuromuscular Electrostimulation Device to Reduce Pain in Atypical Wounds

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BACKGROUND

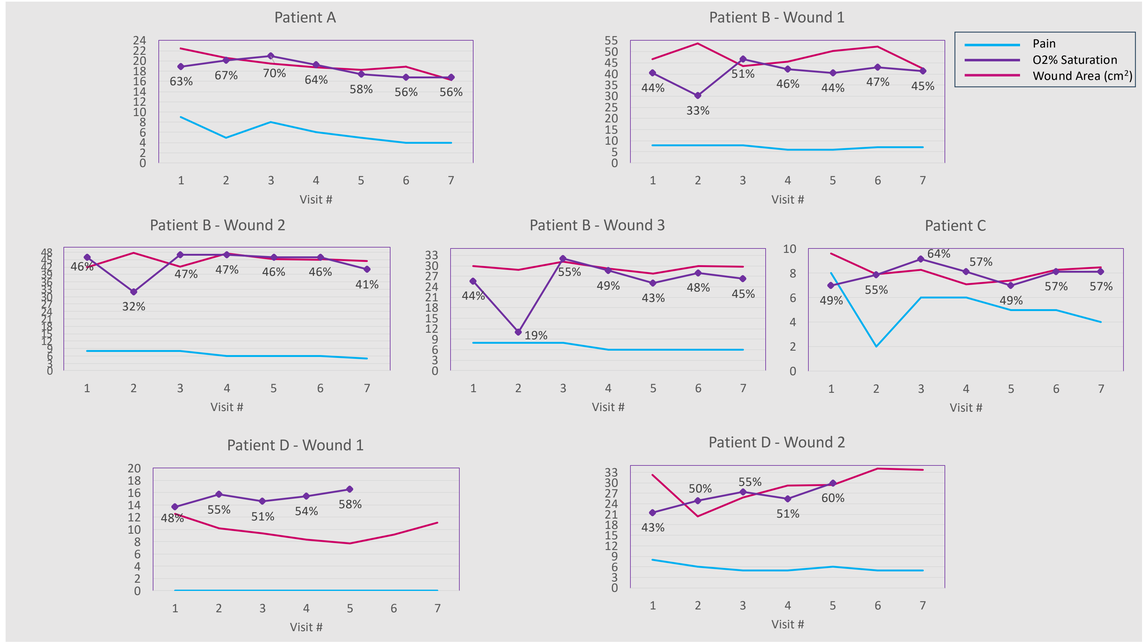
- Atypical wounds are notoriously difficult to treat owing to their usual characteristics, poorly understood etiologies, and the frequently severe pain associated with them. Management often relies on wound care, systemic therapy and pain control, although many still remain chronic.[1]
- Neuromuscular electrostimulation (NMES) is a unique method of increasing blood flow to a lower limb by inducing intermittent muscular contractions via a transdermal stimulus to the common peroneal nerve. NMES has been effectively used in a variety of clinical settings, including pain management, and more recently, its ability to augment microvascular blood flow and heal chronic wounds has been explored with favorable results.[2]
- Considering the importance of adequate flow and tissue oxygenation in wounds healing regardless of etiology and the known efficacy of NMES in managing pain, we assessed if using a NMES device (NMESD*) could facilitate wound closures and decrease pain in several highly recalcitrant, atypical wounds

METHODS

- All patients were instructed to wear the NMESD*(geko™, FirstKind Ltd., High Wycombe, UK) for 12 hours a day over a period of 6 weeks.
- They were seen weekly over 7 weeks for standard wound care, dressing changes, and compression application, when appropriate.
- At each visit, near infrared spectroscopy (NIRS) was used to assess tissue oxygenation as a marker for perfusion and subjective pain was recorded.

RESULTS

- 4 patients and 7 wounds (4 sickle cell, 1 pyoderma gangrenosum, 2 unknown) were included in the study.
- Average initial wound area was 27.9cm2, initial O2 saturation was 42% (range 44%-63%), and initial pain score was 8 for all but 1 wound which had a pain score of 0.
- After 2 weeks of use, almost all patients had a minimum 2 point drop in their subjective pain score.
- After 6 weeks of use, mean pain score was 5.8, average wound area reduction (WAR) was 7.17%, and the average wound O2 saturation was 52% (range 41%-60%) with a mean change in 02 saturation of 5.6%.



DISCLOSURES

NMESD*(geko™, FirstKind Ltd., High Wycombe, UK) was provided to us for use free of charge.

CONCLUSIONS

- While our sample size was limited, use of the NMESD* did not appear to promote a significant WAR in atypical wounds, however, a significant decrease in subjective pain was noted across all participants who initially endorsed pain.
- Based solely on NIRS, use of the NMESD* did not significantly alter tissue perfusion, however, the use of alternative measurement modalities in the future may show differing results.
- Additional analysis using the NMESD* in other wound etiologies may be a valuable and promising future research pursuit.

REFERENCES

1. Becker, S.L., Kody, S., Fett, N.M. et al. Approach to the Atypical Wound. Am J Clin Dermatol 25, 559–584 (2024).
2. Bosanquet DC, Ivins N, Jones N, Harding KG. Microcirculatory Flux and Pulsatility in Arterial Leg Ulcers is Increased by Intermittent Neuromuscular Electrostimulation of the Common Peroneal Nerve. Ann Vasc Surg. 2021;71:308-314.