Goals:
Patients with delayed or non-healing VLUs often require nursing care for 2 years, with incremental increases in costs and negative impact on quality of life. This observational case study reports an evaluation of an innovative neuromuscular electrostimulation Muscle Pump Activator (MPA*) used as an adjunctive therapy with best practices for non-healing venous and mixed venous/arterial leg ulcers (VLUs). The objective was to determine whether the MPA device should be added to the medical supply formulary in 2 community home care programs.

Methodology:
Stimulating the common peroneal nerve (at the fibular head), this MPA device causes passive motion of the flexor muscles, acting as a calf muscle pump, increasing venous (10%)2, arterial (75%)2 and microcirculatory circulation (400%)3 in healthy volunteers. It is wearable, wrist-watched, easy to use, self-adhesive, and battery operated.

Ethics
Ethics review was obtained from The Regional Centre for Excellence in Ethics, Homewood Health Centre, Guelph, Ontario.

Results:
Twelve patients with 18 VLUs recalcitrant to treatment, consented to the evaluation and were followed for up to 20 weeks.

With the patient as their own control, the mean weekly healing rate with MPA for ALL patients was 9.35% (±SD 0.10) compared to pre-geko™ 0.06% (±SD 0.10) (P <0.01). Forty-four percent of wounds healed. None of the patients with wounds which decreased in size but did not heal stayed on the MPA for the full evaluation, for a variety of health and personal reasons. One patient non-adherent with MPA and best practices had wound deterioration in 3 wounds. One patient, featured here, also had a non-healing toe amputation site, which healed rapidly after NMES was implemented.

Patient 1: VLU x 3 months; Surgical amputation of second toe x 4.5 months following angioplasty.

Baseline Ampt. Toe and VLU Both closed @ 5 weeks.

Patient 2: Ulcers x 20 years.

Baseline: Open areas SA 85cm2 covered in yellow fibrin. Pain 10/10; daily dressings for copious exudate, could not tolerate compression.

At 12 weeks: Open areas SA 12.1cm2 stopped geko™ at family request; pain 3/10, nursing visits every 3 days, in high compression bandages.

The pre-mpa device healing rate was 0.06% reduction in surface area (SA) per week, compare to 9.35% reduction (P<0.01) with the mpa device for all patients.

The cumulative proportion healed (ALL patients).

All patients with the MPA device (ulcer healing through 20 weeks).

Three patients not in optimal therapy at baseline were able to increase the level of compression due to decreased pain, further enabling healing. Ninety-two percent of patients and families could be independent with the use of MPA, and were comfortable while wearing it.

Key Messages:
This small case series demonstrated a highly significant effectiveness of the MPA device in these hard-to-heal VLUs. With the MPA there was a 9.35% (±SD 0.10) reduction in SA compared to pre-MPA 0.06% (±SD 0.10) (P <0.01). Further evaluations to determine dose and criteria for patient selection are underway.

References:
4. Author information: CarePartners (formerly, Perfuse Medtec Inc. London, Canada, Hamilton Niagara Haldimand Brant (HNHBB)) Community Care Access Centre®; Mississauga Halton (MH) Community Care Access Centre®; South West Community Care Access Centre®; CarePartners, South West Division, Tillsonburg, ON 4 CarePartners, Mississauga Halton Division, Mississauga, ON, University of Western Ontario, Parkwood Institute London ON Canada®.
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