

TRANSCUTANEOUS CO₂ THERAPY IMPROVES HEALING, TISSUE OXYGENATION AND PAIN IN RECURRENT HARD-TO-HEAL DIABETIC FOOT ULCERS: A RANDOMISED CONTROLLED TRIAL

Prospective randomized controlled trial - 30 patients with recurrent hard-to-heal DFU

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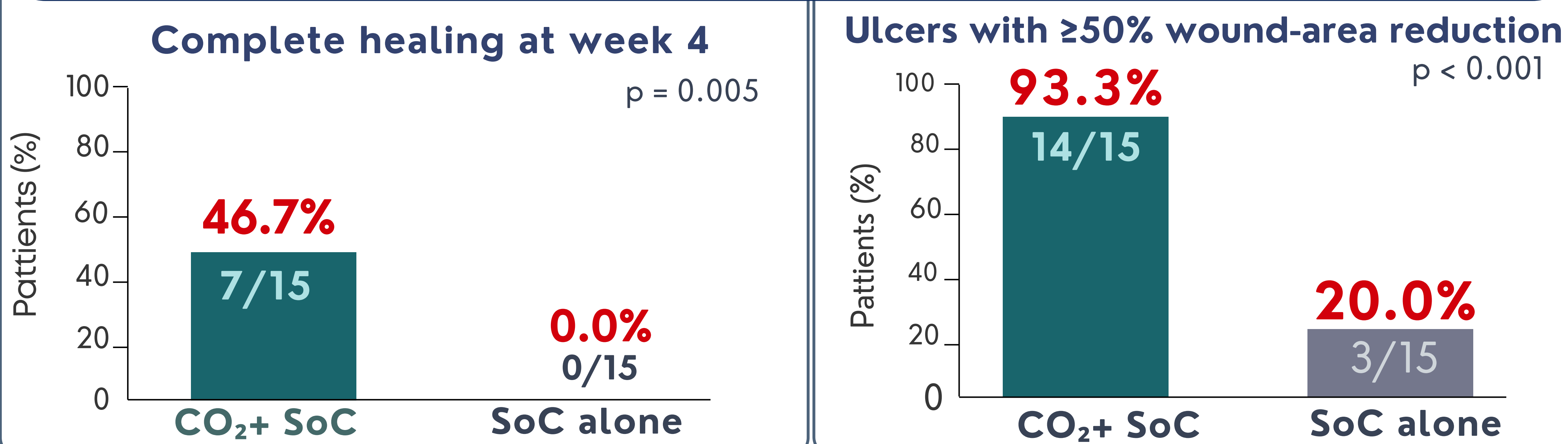
BACKGROUND & AIM

Diabetic foot ulcers remain difficult to heal and are associated with high morbidity and recurrence. This study evaluated whether transcutaneous CO₂ therapy added to standard of care improves healing, tissue oxygenation, pain, and wound condition over 4 weeks in patients with diabetic foot ulcers.

STUDY DESIGN

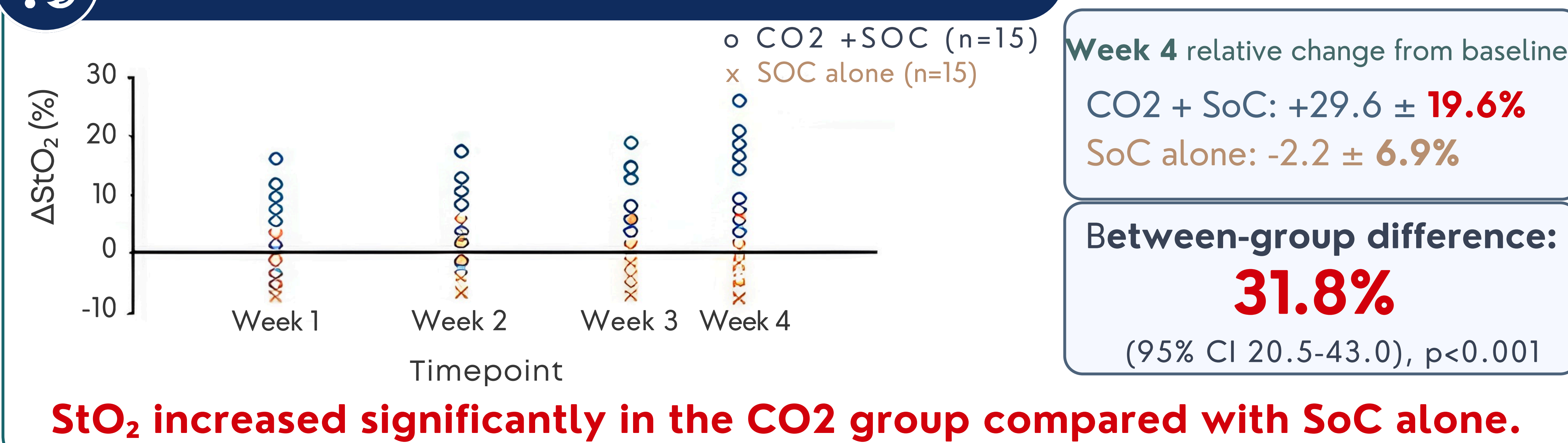
- Prospective randomized controlled trial
- 30 patients with recurrent hard-to-heal DFU
- 1:1 allocation
- Ulcer types: neuroischemic (n=10), ischemic (n=8), neuropathic (n=12)
- Control: SoC alone (n=15)
- Intervention: SoC+ daily transcutaneous CO₂ therapy (n=15)
- 20 weekday sessions over 4 weeks
- Week 4 assessment

KEY HEALING OUTCOMES



Median wound-area reduction: 85.7% (IQR 54.9-100) with CO₂ + SOC vs 17.2% (IQR 0.9-33.5) with SoC alone

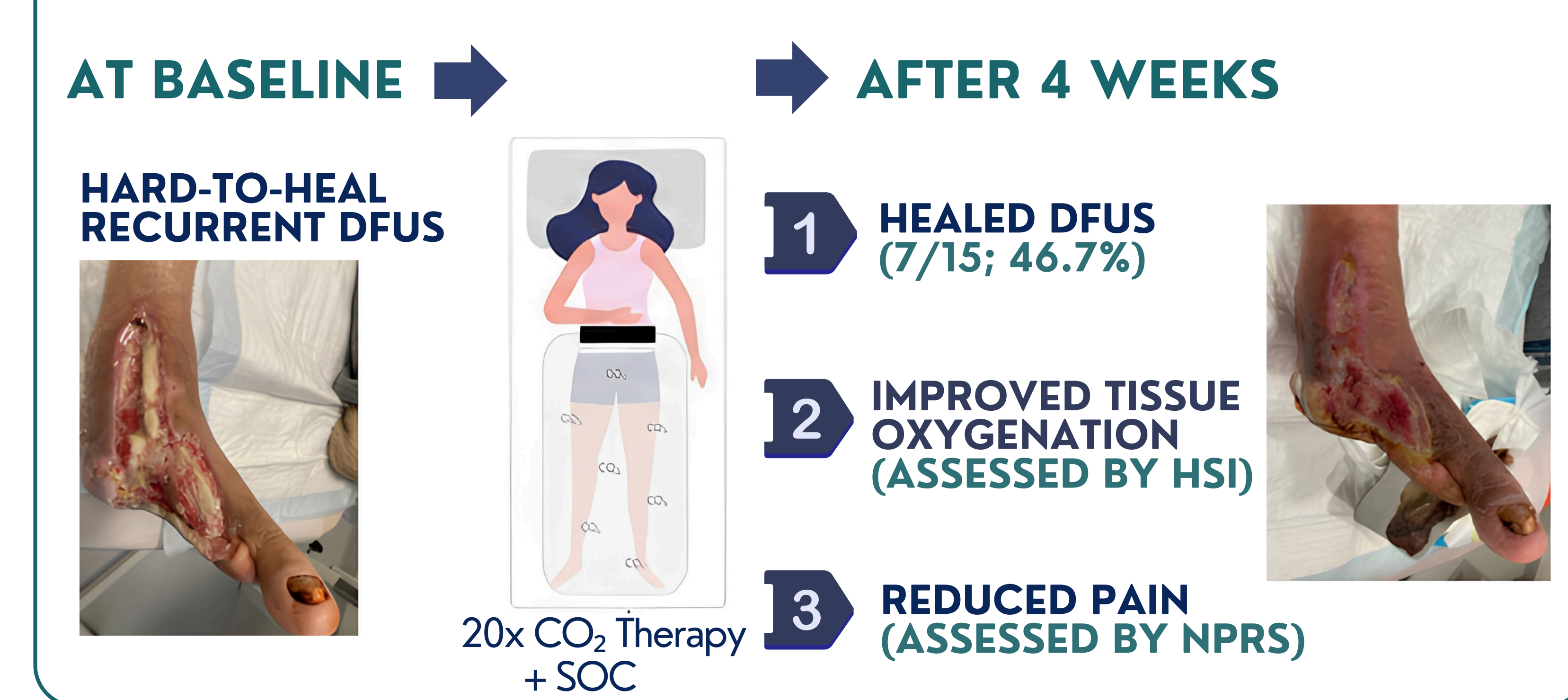
TISSUE OXYGENATION (StO₂)



ADDITIONAL CLINICAL BENEFITS

	Pain-free at week 4	CO ₂ + SoC 40.0% (6/15)	SoC alone 0.0% (0/15)	p = 0.002
	Wound-bed quality	Complete granulation was significantly more frequent with CO ₂ therapy (p < 0.001). Assessed in unhealed ulcers only.		
	Exudate	Absence of exudate was significantly more frequent with CO ₂ therapy (p < 0.001). Assessed in unhealed ulcers only.		

CLINICAL RESPONSE TO CO₂ THERAPY



TAKE-HOME MESSAGE Transcutaneous CO₂ therapy added to standard care was associated with improved 4-week healing outcomes, enhanced tissue oxygenation, reduced pain, and better wound-bed condition in diabetic foot ulcers compared with standard care alone.

No adverse events were observed during the trial.