

The results of a pilot clinical study investigating the short-term impact of continuous diffusion of oxygen (CDO) on cytokines, growth factors and perfusion levels adjacent to the wound was published in the International Wound Journal.¹ This was a prospective study of 23 patients with diabetic foot ulcer below the malleolus investigating changes in cytokines and growth factors, as well as wound closure, within a 3 week timeframe. Secondary outcomes included perfusion changes adjacent to the wound bed and changes in overall bioburden. Results showed significant increases in cytokines, growth factors and TCOM levels one week after application of CDO. Cytokines significantly increased from 280% to 820% in the first week. Significant increases in TCOM indicate increased oxygen perfusion in wound periphery (none of the methods can measure oxygen perfusion levels in the wound bed). Over half the wounds healed at least 50% in 3 weeks.

Cytokines & Growth Factors:

At 1 week, there were significant increases relative to the baseline before CDO (see figure below):

- 820% - TGF- β ; angiogenesis, fibroblast proliferation, collagen synthesis & deposition and extracellular matrix (ECM) remodeling
- 430% - VEGF; angiogenesis, collagen deposition and epithelialization
- 280% - PDGF; cell growth and division, chemotaxis
- 660% - IGF-1; protein production and cell proliferation & migration
- 450% - TNF- α ; leukocyte recruitment, cell regulator, ECM synthesis
- 420% - IL-6; leukocyte infiltration, angiogenesis and collagen accumulation

Wound Closure:

- In the 3 week study timeframe, 53% of subjects had at least 50% wound area reduction

Perfusion in Wound Periphery:

At 1 week, significant changes in TCOM from baseline

- both medial and lateral foot ($p=0.086$ and 0.025 respectively)

“The results of this study demonstrate a significant increase in tissue cytokines after the application of CDO”

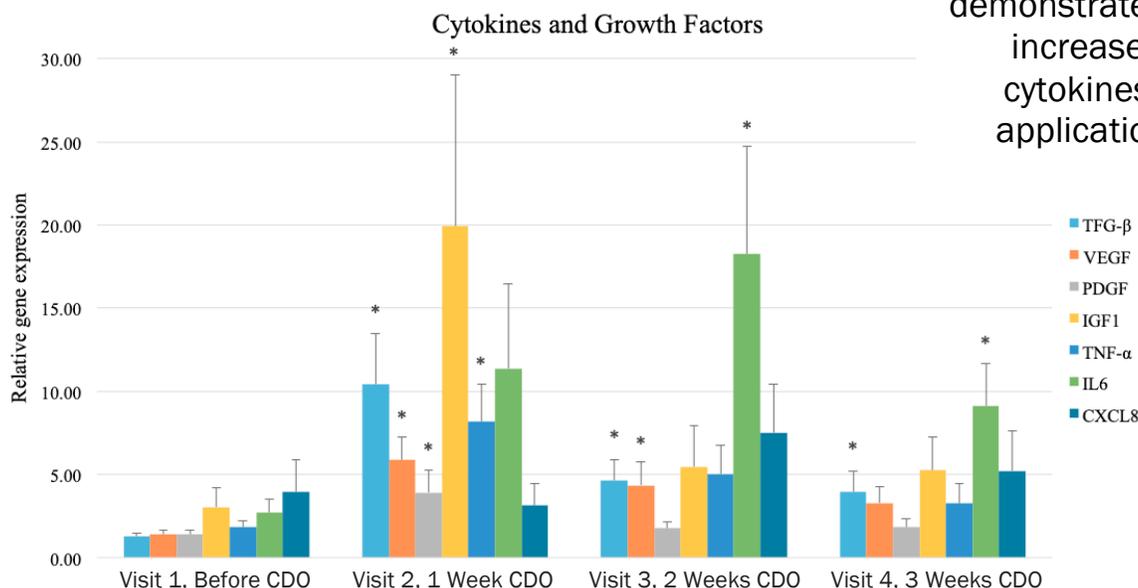


Figure 1. Cytokines and growth factors at each visit. Asterisks indicate significant increase from baseline

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Reference:

1. Lavery LA, Killeen AL, Farrar D, Akgul Y, Crisologo PA, Malone M, Davis KE. The effect of continuous diffusion of oxygen treatment on cytokines, perfusion, bacterial load, and healing in patients with diabetic foot ulcers. *Int Wound J*. 2020;1–10. <https://doi.org/10.1111/iwj.13490>