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Modulation of Wound Healing by Pulsed Radiofrequency Electromagnetic Fields

Abstract: Skin wound healing (WH) is a dynamic and complex process that is achieved through four precisely and highly regulated phases, with the active involvement of platelets, immune cells and fibroblasts. Nonhealing of wounds impact on global health, leading the development of several complications, such as cardiovascular diseases, diabetes, bacterial infection and worsening of the patient's quality of life.

Pulsed RFEF (pRFEF), a non-invasive and non-thermal treatment that exerts its biological effect demonstrating remarkable success in treatment of various types of disorders as bone formation, non-unions, osteoarthritis, and more.

The aim of this in vitro study was to evaluate the wound healing improvement by pRFEF.

To reach our goal we isolated human dermal fibroblasts (HDF) from venous leg ulcers, from 10 patients, and cell proliferation, metabolism, migration ability, and inflammatory mediators' expression and production were evaluated after 6h of pRFEF exposure.

An increase in cell number and migration in the wounded area was observed with a reduction of inflammatory mediators expression and production. Oxidative stress enzyme showed a recovered balance in GSSG/GR activity after pRFEF-treated cells in comparison with untreated cells.

In conclusion, our study provides the experimental groundwork to support pRFEF as a potential therapeutic strategy to promote WH.

Keywords: pRFEF, wound healing, venous leg ulcer, HDF

Biography: I am Erica Costantini, a researcher of General Pathology and Immunology at the University of G.d'Annunzio. My overarching research career goal is to investigate signaling mechanisms in inflammatory modulation in response to exogenous stimuli. The main interest of my research line is the evaluation of the wound healing process both at the cutaneous and at the oral cavity, in relation to natural origin molecules and physical systems that are not harmful to the environment and the man. I already published over 50 papers in reputed journals and has been serving as an editorial board member for several journal.