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Topics discussed: Cutaneous alterations, diabetes

**DIABETIC AND DECUBITUS ULCERS: PILOT PROJECT FOR OUTPATIENT AND TERRITORIAL INTEGRAL TREATMENT INCLUDING FREMS (FREQUENCY MODULATED ELECTRO-MAGNETIC NEURAL STIMULATION)**

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Ulcers are one of the main healthcare problems for the Italian Health Service and their importance and their organisational and economic weight are due to increase in the future. With a view to increasing the quality of services provided to patients, a pilot project has been set up integrating outpatient with territorial treatment making use of electrical stimulation treatment with modulated frequency and amplitude named “Frequency Modulated Electro-Magnetic Neural Stimulation (FREMS), in addition to the conventional type of treatment used for these pathologies. It has been found that FREMS is able to intervene on pathologies affecting the peripheral vascular system<sup>1</sup>, by increasing “vasomotion” in micro-circulation, which gives rise to an improvement in the quality of respiratory exchange in tissues. Indeed, the electrical pulses transmitted by this system produce an important biochemical interaction with the peripheral and deep tissues, causing synthesis and release of growth factors such as Vascular Endothelial Growth Factor<sup>2</sup> (VEGF), basic Fibroblastic Growth Factor (b-FGF), Platelet Derived Growth Factor (PDGF) and Epithelial Growth Factor EGF), well-known regulators of tissue regeneration and of angiogenesis. It is likely that electrical stimulation using FREMS can provide a valid support for ulcer treatment as it performs an anti-inflammatory effect on tissues, reducing edema, by direct action on the immune system (long-term effect) and by the direct mechanism of modulation of specific cytokine such as interferon- $\alpha$  and the Tumor Necrosis Factor (TNF)- $\alpha$ , as well as the effect of lymphatic drainage (immediate effect). These effects transform into a significant reduction in pain<sup>1,2</sup>.

The project foresees the recruitment of 40 patients, 20 of whom treated with traditional therapy and FREMS, to be compared with another 20 patients with similar characteristics, as far as possible, treated with traditional therapy only. The clinical results of the first patients treated (n = 5; 3 diabetic patients and 2 non-diabetic patients) are encouraging. We will report the case of the first patient recruited. The 66-years old female suffered from obliterating arteriopathy and had already undergone the amputation of the lower left limb. She had had two vascular ulcers in her lower right limb for 5 years; one of the ulcers, in her malleolus, had a craniocaudal diameter of 4.7 cm, a latero-lateral diameter of 12.5 cm and a depth of 1 cm and exposure of the tendon. The second ulcer was situated on the tibia, with a craniocaudal diameter of 3.5 cm, a latero-lateral diameter of 7.5 cm and a depth of 0.5 cm. After two cycles of combined therapy (traditional plus FREMS, each cycle comprising 15 daily sessions lasting for 25 minutes each), the lesions were well vascularized, the malleolar ulcer had healed and the tendon, which was completely uncovered before therapy, was now half-covered. The tibia ulcer had flattened and the surface area had been reduced by 45%. Pain, which was unbearable before treatment, had become almost imperceptible. Therapy with FREMS did not give rise to any side effect.

The goal of the project, which will be completed at the end of the year, is to use FREMS therapy alongside traditional therapy, with the aim of reducing treatment time and consequently management costs for ulcerative lesions and of integrating outpatient healthcare with territorial healthcare.

**BIBLIOGRAPHY**

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