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The Effect of Electrical Stimulation In Ulcer Healing: Recent Advances

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Abstract

It is widely accepted that wound healing is enhanced in the presence of an external electrical field. Electrical stimulation appears to increase the rate of ulcer healing and may be superior to standard care for ulcer treatment. Endogenouselectrical potentials are found on the skin surface with several investigators reporting the existence of a battery with negative polarity on intact skin with a voltage that ranges between 10 and 60 mV depending on the anatomical area. When a skin lesion occurs, electric current begins to flow at that point, creating awound potential. Providing that the wound remains moist, this potential promotes wound healing through a phenomenon called 'galvanotaxis'. Electrical stimulation, a technique widely used by physiotherapists for several purposes, has been proved to be very effective in accelerating wound healing through, the enhancement of galvanotaxis and other mechanisms which are clearly demonstrated by many experimental and clinical studies. Angiogenesis, enhanced fibroblast proliferation, growth factor release, wound healing genes expression modulation, increased cutaneous perfusion, muscular contractions and bacterial inhibition, are some of the proposed physiological mechanisms for the acceleration of healing of pressure ulcers, diabetic foot ulcers, and other types of wounds. The lack of consensus of ES application modes and waveforms among trials, do not permit the selection of an optimal modality with specific parameters that can be proposed. Further studies should be conducted to identify the optimal electrical stimulation application technique in order to become clinically acceptable.

Biography

Emmanuel Papadopoulos is Head of the Department of Physiotherapy at Evaggelismos General Hospital. He possesses a graduate diploma in Physiotherapy form TEI of Athens school of physiotherapy, a Master's degree from the University of Southampton and a PhD from the National and Kapodistrian University of Athens. He has published more than 25 in peer reviewed journals authored in medical textbooks. He is a reviewer of scientific journals, including 'Physical Therapy Themes', 'The International Journal of Lower Extremity Wounds' and 'Asclepius nursing journal'.

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