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Pulsed magnetic fields accelerate cutaneous wound healing and do not cause oxidative damage in rats

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The surgical postoperative period requires rapid, effective and good-quality wound repair. An alternative to assist the wound repair to improve the appearance of the scarred region is the use of pulsed magnetic fields. During the treatment aiming wound healing, the pulsed magnetic fields can alter the redox homeostasis of the tissue. This effect depends on the intensity, frequency, and duration of exposure. This study aimed to assess the effectiveness of a pulsed magnetic field in specific configurations on skin healing in male Wistar rats, as well as its effect on the oxidative profile. For this purpose, tissue-removal surgery was performed on the back of all animals, which were separated into two groups: control (no exposure) and the group exposed to the pulsed magnetic field (23 mT, 62 Hz), 30 minutes per day for 14 days. After 3, 7, and 14 experimental days, several analyses were performed: histology, wound contraction, tensile testing, myeloperoxidase activity and biomarkers of oxidative stress in the skin. The treatment with the pulsed magnetic field increased the rate of wound contraction, epidermal and dermal regeneration and the tensile strength of the scar. It was also observed reduction in the inflammatory infiltration and myeloperoxidase activity and did not promote oxidative stress. This results showed that the pulsed magnetic field was effective in wound healing, reduced the infiltration of inflammatory cells in the early stages, contributed to the extracellular matrix remodeling and increased tensile strength of the healed skin. It also maintains a redox homeostasis and do not cause oxidative stress.

Biography

Marcelo Leite da Veiga has completed his PhD in Science, Morphology - Cell and Tissue Biology from University of São Paulo in 2005. He currently serves on the faculty of the Federal University of Santa Maria (RS-BRA) at the Center for Health Sciences, Department of Morphology. He has published more than 40 articles in renowned indexed scientific journals, presenting research on morphological changes in the healing and repair of tissues caused by the action of electromagnetic fields or extracts of medicinal plants.

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