

Cellular response to photodynamic therapy in chronic wounds

Pier Paolo Lecci¹, Alessandro Corsi², Virginia Lotti¹, Daniele Torchia³, Carmelo Mavilia⁴, Nicola Pimpinelli³, Paolo Romagnoli¹, Pietro Cappugi³ and Stefano Bacci¹

¹Department of Anatomy, Histology and Forensic Medicine, University of Florence, Florence, Italy

²Santa Maria Nuova Hospital, Florence, Italy

³Department of Critical Care Medicine and Surgical, University of Florence, Florence, Italy

⁴Department of Internal Medicine, University of Florence, Florence, Italy

A wound is considered chronic if it does not heal timely. Basic processes at work are similar to acute healing, but their persistence leads to abundant granulation tissue and possibly fibrosis, scar contraction and loss of function [1]. Wounds may become chronic because of local and systemic conditions and are a major concern in clinical dermatology. Photodynamic therapy (PDT) has been proposed for these cases, through the administration of aminolaevulinic acid (ALA), leading to the synthesis of the photosensitizer protoporphyrin IX (PpIX), followed by illumination with visible light [2]. To study the effects of this therapy on the cell infiltrate of chronic wounds, cryosections of lesions before and after PDT were post fixed in cold acetone and stained with haematoxylin and eosin or immunolabeled with antibodies to laminin 5 (for basement membrane), HSP47 (for fibroblasts), alpha-smooth muscle actin (for myofibroblasts), SPM250 (for granulocytes). Intact neighbor skin was used as control. The cellular infiltrate, as well as the thickness of epidermis, the vascularization and the number of fibroblasts appeared increased in chronic wounds over healthy skin. After completion of PDT, fibroblasts appeared further increased in number, the treatment seemed to stimulate the connective tissue cells responsible for tissue repair rather than the inflammatory infiltrate (Supported by Ente Cassa di Risparmio di Firenze, grant 3681 to S.B.).

References

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