

EVALUATION OF SPONGE-LIKE DRESSING IN A NOVEL IN VIVO MURINE MODEL OF SKIN ULCER

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PURPOSE

The aim of this work was to study the tissue regenerative performance of a novel natural polymeric formulation alone or in combination with platelet lysate (PL) in a murine model of thermal third degree skin burns.

METHODS

Chitosan glutamate sponge-like dressing (WF), obtained by freeze drying, were loaded with chitosan oleate polymeric micelles ($\varnothing=240\text{nm}$ c.a.), containing alpha-tocopherol as antioxidant agent or silver sulfadiazine as broad spectrum anti-infective drug. The dressing were designed to be used either alone or in combination with a hemoderivate, platelet lysate, to provide a protection and a controlled release system for growth factors contained in it.

The in vivo study used a novel rat model of thermal third degree skin burns. Briefly, male rats (Wistar, 250g) were anesthetized and the dorsum was shaved. Subsequently a full-thickness 4-mm diameter burn by contact with a brass rod heated at 105°C and applied for 40 second was carry out. The day after. Three 4mm full-thickness excisional wounds was realized.

Each lesions were treated with a single formulation loaded with platelet lysate or with physiological solution (control). Dressing without PL were tested too, by applying them to wounds in two different amounts (WF1 and WF2) to test the effect of dressing components. A wound healing > 80% was considered the endpoint.

RESULTS AND CONCLUSIONS

The results confirm that the platelet lysate growth factors play a key role in the wound healing. The dressing resulted compatible with hemoderivative growth factors. A positive effect was observed on wound healing also in case of lesions treated with dressing without PL. A regeneration, respectively, of about 85% (PL), 60% with WF1 and 90% with WF2 of the starting burned area was found vs 45-50% observed in control lesion treated with saline.