MELANOCORTINS IMPROVE WOUND HEALING IN EXPERIMENTAL BURN INJURY

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Burn wounds represent a serious problem in the clinical setting and are accompanied by high morbidity and mortality. In the burn injury, the inflammatory response (local and systemic) plays an important role. Melanocortin peptides have an antiinflammatory activity also in skin inflammatory reactions, and the skin is a locoregional source for several melanocortin peptides. Moreover, it has been suggested that the melanocortin α-MSH might act as a modulator of extracellular matrix composition. Here we investigated the possible modulatory role of melanocortins in wound healing in a rat model of burn injury. *Methods.* After general anesthesia, 20% of the total body surface area of rats was exposed to 80°C water for 10 seconds to achieve a second degree burn. Five minutes after burn injury (then every 12 hours for the 14 days of observation period) rats were i.p. treated with either saline or the synthetic melanocortin analog [Nle^4, D-Phe^7]α-MSH (NDP-α-MSH, 340 μg/kg). *Results.* In saline-treated control rats, histological examination of the burned skin performed on day 14 showed edematous and inflammed granulation tissue, and immature collagenous tissue, with no epithelial covering. Furthermore, few newly formed and immature vessels along with fibrin deposition, hemorrhage, interstitial edema and evidence of generalized vascular congestion were observed. On the other hand, NDP-α-MSH improved burned skin reepithelialization through an increase in epithelial proliferation, maturation of collagen matrix and angiogenesis. In burn wounds, also VEGF mRNA and Ang-1 mRNA levels (assessed by RT-PCR) increased, as well as eNOS and iNOS expression (assessed by Western blot). NDP-α-MSH also reduced edema and the inflammatory infiltrate. *Conclusions.* Our findings indicate that melanocortins are able to improve wound healing in burn injury. They suggest that this beneficial effect might be due to increased production of VEGF and NO derived by both eNOS and iNOS, as well as to modulation of the inflammatory reaction, likely during both the acute and late phase of thermic stress.