Introduction.

Vascular ulcers are a serious health problem and its have a prevalence between 1-3%. About 80% of these ulcers are caused by venous stasis, between 10% and 25% are of arterial origin, while 25% are of mixed origin arterial and venous. On the other hand, the diabetic foot is a complication found in 15% of diabetic patients. The ischemia in this disease is a major risk factor for the surrounding tissues that are involved in wound healing. In this sense any angiogenic stimulus, that ensures an increase in the vascularization of the damaged area, could improve the process scar in those pathologies where healing could be found in a compromising situation. Therefore, our objective in this study was to evaluate the effect of a potent angiogenic factor, Proadrenomedulin N-terminal 20 peptide (PAMP), on the healing process of excisional skin defects in an experimental model.

Material and Methods.

Experimental animals: A total number of 10 male white New Zealand rabbits, weighing between 2250g and 2500g (2237.65±125.23) were used in this study.

Experimental design: Animals were divided into Normal group (n=5) and Ischaemic group (n=5). The ischemia was performed by clamping of the central artery and central vein to the ears of experimental animals. The degree of induced ischemia was monitored by measuring transcutaneous oxygen pressure (TCM-4, Radiometer, Spain) in the area of the defect A 2 cm diameter defect was created in both ears of every rabbit: left ears without treatment (control) and right ears with PAMP treatment (100mM).

The animals were sacrificed after 14 days and the samples were obtained. Wound contraction area, reepithelialization and angiogenesis were determined. All quantitative values were analyzed by ANOVA and Student t test to determine statistical significance.

Results.

The transcutaneous oxygen pressure was 24.0 ± 6.28 mm Hg for the ischemic group, compared with 53.20 ± 8.36 mm Hg detected for the normal group, which is a level 3 of ischemia, according to the valuation table designed by our group. The morphometric results showed a similar contraction rates among control group and treated with PAMP in both the normal animals (50.83 ± 4.85% vs 43.28 ± 2.15%) and in the group of animals subjected to ischemia (p = 0, 2926). In addition, treatment with PAMP induces a higher rate of re-epithelialization (98.08 ± 1.03) compared with the control group (71.15 ± 1.15) in both healthy animals and those undergoing ischemia (p <0.0001). Finally, PAMP induced a statistical significant increase in the number of vessels observed in the regenerated area (p<0.05)

Conclusion.

PAMP treatment induces a strong neovascularization in the scar area. It also enhances the formation of granulation tissue and profuse enrichment of myofibroblasts, which contribute to the contraction of the denuded area and facilitate re-epithelialization of the wound.

Acknowledgments

The present work was supported by grant FMM06 and SAF2009-13240-CO2-02