

Heat shock proteins, extracorporeal shockwaves and wound healing process

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Device and producing company:

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Introduction:

The human organism provides, in addition to the enzymatic-oxidative protective system, a further defense mechanism through the formation of so-called stress proteins. Part of this defense mechanism is the group of so-called heat shock proteins (HSP), which can be formed quickly and in substantial quantities as a cellular response to external physical or chemical stress. So far, HSP are founded in nearly all eukariotic cells. They are divided into groups according to their molecular weight. The number given to any particular group is a rough indication of the molecular weight in kilodaltons. HSP60 and HSP70 concentration and presence in the blood serum of patients and in wound liquid and tissue seem to be able to serve as indicator not only for the wound healing process, but also as a yardstick for the antiulcerative effect of using extracorporeal shockwaves to support wound healing.

Methods:

Detection of HSP60 - Elisa kits; HSP70 - Western blot. Group I Patients with retarded healing traumatic wounds: a. usual treatment; b. treatment supported by ESW. Group II Patients with chronic-septic wounds: a. usual treatment; b. treatment supported by ESW

Results:

Group Ia: HSP60 and 70 concentration decreased continuously until wound healing. Group Ib: HSP60 concentration increased continuously in wound liquid and tissue; HSP70: the same observation but not as marked. The process of wound healing in group Ib proceeded noticeably. Group IIa: HSP concentration in wound liquid and tissue remained nearly the same until the end of the wound healing process. Group IIb: extraordinary increase of the HSP60 expression in wound liquid and tissue; also HSP70 increased more than in group Ib.

Discussion:

Despite of the small collective of patients one can say that the expression of heatshock proteins - especially HSP60 - induced by extracorporeal shockwaves within the wounded tissue significantly accelerate the healing process.

Conclusion:

The results of these experiments provide part of the explanation for the impact of the ESWT on dermal injuries.