REACTOGENICITY OF HYDROXYAPATITE (HA) BIOCERAMIC GRANULES IN EXPERIMENTAL WOUNDS OF EAR CARTILAGE

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There are different needs for bioengineering of cartilage structures in maxillofacial region. At first scaffold to provide shape, size and mechanical protection of regenerative structures as material must be biocompatible with tissue to be bioengineered. Biocompatibility includes basic characteristics as toxicity, mutagenity, teratogenity, chemical signals and reactogenicity which consists of non-specific reactogenicity or influence on inflammatory response and specific reactogenicity or bioactivity (Slutskii, Vetra,1996).

Aim of study: Histological and histochemical evaluation of cartilage tissue response on implantation of HA granules in wounds of rabbit ear cartilage.

Material and methods: In 18 rabbits ears under local anesthesia with intravenous sedation implantation of synthetic HA ceramic granules 0,2 – 0,4 mm Ø , with Ca/P ratio 1,66 , porosity 35 – 40 % (RTU LB) supraperichondraly, subperichondraly, in excisional defects was done.

Samples were taken out after 4 and 8 weeks, fixed in neutral formalin, embedded in paraffin, stained Hem/Eoz, van Gieson/Romeis, PAS/Alcian blue (pH 2,5), Masson trichrom.

Results: After supraperichondral implantation after 4 weeks restitution of perichondrium, capsule formation with active fibroblasts, haemorrhagies, leucocites, interstitial oedema. After 8 weeks – complete restitution of fibrous external perichondrium , moderate cell activity in internal cambial layer, large chondroblastic cells under perichondrium. After subperichond-ral implantation more active proliferation of large chondroblastic cells, thin capsule between HA granules and new formed cartilage. In cartilage excisional defects after 8 weeks chondroblatic „volcano" around granules, increase of neutral glicosaminoglicans around granules and acid glicos-aminoglicans in new formed cartilage.

Conclusion: Porous synthetic HA ceramic granules implanted in wounds of rabbit ear cartilage in part of non-specific reactogenicity has no more active inflammatory response as in control wounds. In part of specific reactogenicity there was more active differentiation and proliferation of large chondroblastic cells, which may be result of chondroinductive property.