

PERSPECTIVE OF CLINICAL APPLICATION OF HUMAN MSC-LIKE CELLS AFTER LASER DERMABRASION.

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Introduction: The skin is organ in which to high intensity there is a process of self-renewing of cells and restoration of its various damages. This process is provided by means of consecutive differentiation stem cells of skin. It's known, that besides epidermal stem cells located on basement membrane, in dermal layer of a skin there are undifferentiated cells which also participate in its regeneration. The aim of our studies was isolation and characterization of MSC-like cells from human skin, and an estimation of prospective of their application in regenerative medicine.

Methods: MSC-like cells were isolated from human dermis. The piece of skin has been received with the agreement of the patient during operation on abdominoplasty of the person with application of an endotracheal narcosis. Skin from abdomen was carefully dissected free of other tissues, mechanically fragmented and then digested with 0,1% Collagenase type IV (Gibco, USA) for 30 min at +37°C. Isolated cells were resuspended in growth medium DMEM (Gibco, USA). The received cells were immunophenotyped by antibodies (Becton Dickinson) to surface antigens - CD10, CD13, CD29, CD31, CD34, CD44, CD45, CD49a, CD49b, CD49d, CD49f, CD71, CD73, CD90, CD105, CD106, CD117, CD166, HLA-ABC, -DP, -DQ, -DR. As the basic inductors for osteo-, adipo- and chondrogenic differentiations were used beta-glycerophosphate, indomethacin / isobutylmethylxanthin and TGF-beta-1 accordingly. For laser dermabrasion of patient's face was used erbium laser UltraFine Er-YAG (Coherent Inc., USA) with length of a wave 2,94µm, density of capacity 5J/cm², radius of a laser beam 2,5mm. With the agreement of patients have been generated 2 groups on 5 patients. For clinical trial MSC-like cells were washed from growth medium and free from

infectious and other agents. In experimental group: on the postoperative laser surface were single applied MSC-like cells of skin in 3% hyaluronic acid (biomatrix) in isotonic solution and covered with an aseptic protective at 24h. Then were applied Ung. Solcoseryl (Poland) up to full epithelization. In control group regeneration of epithelium was spent by standard method - Ung. Solcoseryl.

Results: We isolated MSC-like cells from human dermis. Immunocytochemical analysis of the received cellular population has shown presence high expression of the following surface Ag's (%) - CD10 (84,1), CD13 (99,6), CD29 (99,8), CD44 (99,4), CD49a (96,1), CD49b (81,6), CD49d (67,7), CD73 (99,4), CD90 (99,3), CD105 (92,7), CD166 (97,6), HLA-ABC (99,9) and absence expression of Ag's (%) - CD31 (0,9), CD34 (1,1), CD45 (0,9), CD49f (1,9), CD106 (1,0), CD117 (0,7), HLA-DP (0,7), HLA-DQ (0,8), HLA-DR (0,8). At presence of inductors in growth medium the received cells were differentiated into cells of a bone, adipose and cartilage tissue. Clinical application of these cells has shown that using MSC-like cells in biomatrix allows to achieve complete epithelization practically on 5-7 day, in control group (without cells) - 9-11 days. During the postoperative period at observance by patients of a sun-protective regime complications don't noted. Hyperemic portions assumed normal coloration within 1-1,5 months, in control group - 2-2,5 months.

Conclusions: We derived MSC-like cells from adult human skin which are a perspective material for regeneration of skin in various fields of reconstructive medicine, particularly in combustiology and cosmetology.