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Wound Care 2019: Pilot project of regenerative therapy on skin rejuvenation - Jana Janovska - Riga Stem Cell Centre

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Introduction: During skin aging, cumulative photo damage, exhaustion of endogenous stem cell populations, mechanical stress, and increased fibrosis lead to skin with decreased epidermal thickness and compromised dermal integrity (Maciej Nowacki et al, 2018). Stem cell-based therapies have been widely used for their abilities to repair and regenerate different types of tissues and organs in cosmetic and plastic surgeries. Despite the fact, that most treatments involving stem cells are new and have very little evidence based efficacy, stem cell treatments for skin rejuvenation are already being hailed as the preferred method by which to perform a facelift non-surgically (Odunze M et al 2011). Mesenchymal stem cells (MSCs) seem to be an ideal source for tissue engineering application due to the lack of ethical concerns, high availability and increasing number of methods for isolation and expansion of such cell types (Davood Mehrabani et al).

Aim: Our aim of the study to analyze effectiveness of autologous fibroblasts application on skin post fractional laser rejuvenation.

Materials & Methods: Both Gender Caucasian patients were revealed, aged 35-55 years. Punch biopsies 5 mm and skin excision were done. Punch biopsy has sterilized in 70% ethanol for 2 min. Wash the biopsy pieces in 0.9% sodium chloride by centrifugation at RT for 5 min at 2000xg. After washing, using the sterile forceps put the piece of skin in T25 cm2 flasks and add DMEM media with 10% of HyClone supplement and 1% of Penicillin/Streptomycin. Place the flask in 37 ºC incubators and incubate approximately for 2 weeks till 80-90% of cell confluence. Once the fibroblasts are confluent, transfer them to more T75 cm2 flasks till get 5x106 for freezing and checking the fibroblast sterility to bacterial and fungi contamination, mycoplasma contamination, karyotype and cell surface markers-CD105, CD90, CD73, CD44.

Results: Once the cells from punch biopsy get confluent, fibroblasts are passaged to two more passages to get more cells for cryopreservation and for characterization.

As flow cytometer data shows isolated fibroblasts from all five patients are more than 95% positive to CD105, CD90, CD44, CD73 and 0% positive to negative cell surface markers - CD19, CD34, CD45, CD11b, HLA-DR. Sterility test for bacterial and fungal contamination were negative for all patients sample. Mycoplasma contamination test were negative for all five patients sample. For autologous fibroblasts application on skin were used 15x106 cells in 1% Natrosol gel.

Conclusion: Cellular therapy based on autologous dermal fibroblast holds enormous promise to the field of regeneration medicine. It offers a safe, immunologically acceptable and simple alternative for tissue regeneration applications. Cellular therapy based on autologous dermal fibroblast holds enormous promise to the field of regeneration medicine.

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