obtained from the groin area. The healing rate of the defect of all groups were assessed by measuring size of the defect weekly. The specimens from the wound site were obtained from all groups on day 14 and day 28 post-operative for histopathological analysis for vascular density and collagen content.

Results: The integrity of dermal collagen structure of ADM was retained as shown histologically. The BM-MSCs were successfully seeded on the ADM. Gross observations of the degree of wound healing revealed better implantation of seeded ADM with MSCs in group III. Furthermore, histologic analysis showed no neovascularization, keratinocyte migration, hair follicle growth, increased collagen content, and fewer inflammatory cell infiltrate in group III as compared with the other groups.

Conclusion: It was concluded that stem cell seeded ADM facilitated early and better healing of skin defect in rats than the non-cell seeded ADM as well as the autograft.

The effect of low dose statin combined with grapefruit on muscle structure and the possible protective role of mesenchymal stem cells

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Background and objectives: Statins are the cornerstone of therapy for dyslipidemia. They are generally well tolerated but can produce a variety of skeletal muscle adverse reactions, ranging from muscle pain to frank rhabdomyolysis. Grapefruit juice increases the plasma concentrations of simvastatin thus increasing both the cholesterol-lowering effect and the risk of adverse effects. Stem cells have been recognized as a potential tool for the development of innovative therapeutic strategies. This study was conducted to evaluate the effect of low dose statin combined with grapefruit ingestion on muscle structure and the possible protective role of bone marrow mesenchymal stem cells (BM-MSCs) in female rats.

Materials and methods: Thirty adult female rats were divided into two groups. Group I: control group (n = 12) equally subdivided into two subgroups. Subgroup IA (grapefruit control); oral grapefruit juice was given daily in a dose of 5mg/kg, Subgroup IB (statin control); oral Zocor® was given daily in a dose of 20mg/kg suspended in tap water. Group II: Experimental group (18 rats) in which 20 mg/kg Zocor® suspended in 5mg/kg grapefruit juice was given daily. This group was subdivided randomly into subgroup IIA (statin + grapefruit) in which the previous dose was given for 45 days, Subgroup IIB (IM- MSCs) in which two intramuscular (IM) injections of BM-MSCs was given, Subgroup IIC (IV- MSCs) in which two intravenous (IV) injections of BM-MSCs was given in days3 and 33 of the experiment. Plasma level of creatinine kinase was obtained at various intervals. All animals were sacrificed after 12 days from last injection and gastrocnemius muscle samples were collected and processed for light and electron microscopic study.

Results: Both control subgroups showed unremarkable muscle changes. However, in subgroup IIA, loss of muscle striations in some fibers, increased nuclear number, subsarcolemmal mitochondrial changes, separation of myofibrils, affection of some sarcomeres with loss of Z lines and prominent t-tubules as well as increased collagen and glycogen were detected. In subgroups IIB and IIC these muscle changes were ameliorated.

Conclusion: Low dose statin combined with grapefruit resulted in muscle structure changes. These changes were ameliorated with either IM and IV injection of MSCs, however IM injection showed better results.

Enhancement of vascular differentiating of human adipose tissue -derived stem cells using human chorionic gonadotropin

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Human adipose tissue is highly vascular, rich source for adipose mesenchymal stem cells. Pericytes are vascular progenitor cells that surround the endothelial wall of blood capillaries and play an important role in maintaining the integrity, development and maturation of blood vessels. Due to their important role in vascular regeneration, we isolated pericytes from human abdominal adipose tissue by tissue culture explant, and compared their vascular regenerative potential with adipose-derived mesenchymal stem cells (ASCs). ASCs displayed typical fusiform plastic adherent cells, while pericytes showed fibroblast-like morphology with prominent eccentric nuclei, limited cytoplasmic content and numerous cytoplasmic processes. Using flowcytometric analysis, ASCs showed positive expression of typical mesenchymal stem cell markers, CD73 and CD105, and were negative for hematopoietic stem cells marker CD45. Pericytes were also positive for CD73, CD105 and were negative for CD45, and additionally expressed the pericyte markers; desmin and alpha smooth muscle actin. Both ASCs and pericytes were differentiated into cells of adipogenic and osteogenic lineage after using the specific differentiation factors. Angiogenic potential of the two cell types was assessed using tube formation assay. While both ASCs and pericytes show angiogenic potential, tube formation was more robust on stimulating pericytes with the appropriate angiogenic factors. Human chorionic gonadotropins (hCG) were then investigated for enhancing the angiogenic potential of both adipose derived cells. HCG is a reproductive hormone that has an important role in promoting, inducing and maintaining angiogenesis of uterine vasculature throughout pregnancy. ASCs and pericytes were cultured in the presence or absence of 10IU/ml hCG for 48hrs. HCG enhanced tube formation from both cell types, however, higher capacity for angiogenic potential was observed in human adipose derived pericytes compared to ASCs cultured under the same conditions. Upon further incubation in angiogenic differentiation media, both cell types showed enhanced expression for vascular endothelial growth factor (VEGF), a highly specific marker for angiogenesis, and CD31, a marker for endothelial cells and angiogenesis. This is the first report to identify the procurement of pericytes with robust vascular differentiation potential from the adipose tissues. These cells have significant applications in regenerative medicine and vascular ischemic diseases.