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Bone marrow stem cell vs stromal vascular fraction from ASCs for critical limb ischemia in the diabetic foot therapy

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The aim of our study was to prevent major limb amputation (MLA) in this group of patients using a local application of autologous bone marrow stem cells (ABMSC) concentrate. A total of 96 patients with CLI and foot ulcer (FU) were randomized into Group I and II. Patients in Group I, n=42 (36 males, 6 females, 66.2 ± 10.6 years) underwent local treatment with ABMSC while those in Group II, n=54 (control, 42 males, 12 females, 64.1 ± 8.6 years) received standard medical care. The frequency of major limb amputation in Group I and II was 21% and 44% within the 120 days of follow up, respectively ($p<0.05$). Only in salvaged limbs of Group I both *Toe pressure* and *Toe brachial index* increased (from 22.66 ± 5.32 to 25.63 ± 4.75 mmHg and from 0.14 ± 0.03 to 0.17 ± 0.03, respectively, Mean ± SEM). This difference was statistically significant ($p<0.040$). We conclude ABMSC therapy results in 79% limb salvage in patients suffering from CLI and FU. In the remaining 21% lymphopenia and thrombocytopenia were identified as potential causative factors suggesting that at least a partial correction with platelet supplementation may be beneficial.

Most important point:

The CD34+ cell counts in bone marrow concentrate (BMC) decreased (correlation, $p=0.024$) with age, even though there was no correlation between age and healing. An unexpected finding was made of relative, *bone marrow lymphopenia* in the initial bone marrow concentrates in patients who failed ABMSC therapy (21% of MLA).

Most promising thing recently discovered:

Stromal vascular fraction of fat tissue lipoaspirate play important role in preventing MLA (Major limb amputation) in 75% of patients even with renal insuficiency and poor bonne marrow aspirate. It may be additional tool for NO-CLI patients treatment.

Most concerning thing recently discovered:

SVF-ASC may have additional role in metabolic,imunomodulation and imunosupressive effect in patients with T2DM and critical limb ischemia for wound healing, glyc HbAlc and and other metabolic markers.

Something Dr. Prochazka learned at the 2012 Cell Society meeting:

Mesenchymal stem cells may be described as pericytic cells and have a consequences similar to “drug store” with multipotent effects in different diseases

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