

Involvement of adipogenic potential of human bone marrow mesenchymal stem cells (MSCs) in osteoporosis

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Mesenchymal Stem Cells (MSCs) from bone marrow stroma are capable of differentiating into osteoblasts and adipocytes, among other cell phenotypes. In normal bone marrow osteoblastic and adipocytic cell differentiation occur in favor of bone formation, but this relationship appears disrupted in several bone diseases. In osteoporosis increased bone marrow adipocyte production is counterbalanced by diminished production of osteogenic cells. Since osteoblasts and adipocytes originate from a common MSC precursor cell, quantitative and qualitative stem cell defects may underlie the modified number and function of differentiated cells. This review analyzes experimental evidence which describes differences in the osteogenic/adipogenic potentials of human bone marrow MSCs obtained from control and osteoporotic post-menopausal women. The protective effect exerted by locally generated factors, such as estradiol and leptin, on MSCs differentiation was analyzed, because altered bioavailability of th