Title: Property of Adult Stem Cells Under the Circumstance of Obesity.

Abstract: Obesity is a high risk factor for musculoskeletal disease such as osteoarthritis. People believe the mechanism is that obesity altered property of the stem cells, which exist in bone and adipose tissue and then impair the tissue repair process. In this study, bone marrow-derived mesenchymal stem cells (MSCs), subcutaneous adipose-derived stem cells (sqASCs) and infrapatellar fat pad-derived stem cells (IFP cells) were obtained from lean and obese mice, and their cellular properties were examined. Results showed that obese mice have a trend toward increased prevalence of MSCs and sqASCs in the stomal tissues. The differentiation potential of all the stem cells was altered by obesity, however obesity affects those stem cells in different ways. Obese MSCs also showed decreased CD105 and increased platelet-derived growth factor receptor alpha expression. FFA treatment of lean stem cells altered the multipotency but did not completely recapitulate the properties of obese stem cells. In summary, obesity does have a strong impact on some specific stem cells regarding their potential of differentiation.

Reference: