Hormone Replacement Exerts Positive Regenerative Effect on Joints Damaged by Osteoarthritis

The World Health Organization estimates that worldwide, osteoarthritis affects 9.6% of men and 18% of women ages 60 years or older, and the condition will be the fourth leading cause of disability by 2020. It is generally accepted that disturbances in joint architecture due to trauma, abnormal load, endocrine diseases (diabetes, hypothyroidism) or inflammatory conditions may result in osteoarthritis. Nicolai Miosge, from August University (Germany), and colleagues examined arthritic tissue during the late stages of osteoarthritis. The researchers speculated that chondrogenic progenitor cells (CPCs) may be influenced by sex steroids, and therefore hormone replacement therapy directed to the joint fluid could be beneficial in restoring damaged tissue. Tissue samples from 372 patients who underwent total knee replacement were analyzed. The mean age was 71 years of age for men and 72 years for women, with women representing 64.25% of participants. Estrogens are known to influence bone metabolism and researchers found that 17beta-estradiol (E2), which increases calcium deposition in both sexes, was present in the joint fluid of study participants. CPCs positive for estrogen receptors (ER-alpha and ER-beta) as well as androgen receptors were present in the osteoarthritis tissue as well. Both estrogen and testosterone influenced the expression of all 3 receptor genes and the CPCs by regulating gene expression. Observing that: "Physiologic concentrations of testosterone in men and premenopausal concentrations of estrogen in women have a positive effect on the chondrogenic potential of CPCs in vitro," the team concludes that: "Therefore, strategies of hormone replacement in the synovial fluid of women and men might have beneficial effects on the regenerative potential of arthritic cartilage tissue in late stages of [osteoarthritis]."

Sebastian Koelling, Nicolai Miosge. "Sex differences of chondrogenic progenitor cells in late stages of osteoarthritis." Arthritis & Rheumatism, Volume 62, Issue 4, Date: April 2010, Pages: 1077-1087.