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The role of biomarkers in osteoarthritis and osteoporosis for early diagnosis and monitoring prognosis

Biyobelirteçlerin osteoartrit ve osteoporozda erken tanı ve prognozun izlenmesindeki rolü

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Osteoarthritis and osteoporosis are two diseases related to the skeletal system that have high incidence rates.[1] The incidence of osteoporosis and osteoarthritis in society is increasing depending on many factors such as increased ratio of the elderly population with prolonged life expectancy, sedentary lifestyle, and malnutrition.[2]

The heterogeneity of the human population, lack of complete understanding of the osteoarthritis disease process, and the slow progressive nature of the disease characterized by prolonged periods of nonsymptomatic, degenerative changes led to development of diagnostic and prognostic biomarkers.[3]

There are a number of promising candidates for biomarkers such as urinary C-terminal telopeptide of type II collagen and serum cartilage oligomeric matrix protein, while none is sufficiently discriminating for diagnosis or prediction of prognosis in patients or for use as a surrogate outcome in clinical trials.[4] However, the combination of specific markers seems to improve the prediction of disease progression at the individual level.[5]

Micro-ribonucleic acids could serve as useful clinical biomarkers in the diagnosis of certain diseases such as intervertebral disc degeneration.[6]

Transglutaminase 2 represented a suitable biomarker of osteoarthritic chondrocyte activation, whereas osteocalcin, osteopontin and sclerostin characterized osteoporotic osteocyte/osteoblast changes.[7]

The rates of bone production and destruction can be evaluated by assaying bone matrix components released in the bloodstream and excreted in the urine. These are biomarkers of formation: bone-specific alkaline phosphatase, osteocalcin and biomarkers of resorption: N-terminal and C-terminal crosslinking telopeptide of type I collagen. In case both events are coupled and change in the same direction such as osteoporosis, biomarkers will reflect the overall rate of bone turnover.[8]

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