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Advances in the treatment of osteoarthritis

Osteoarthritis (OA) which affects the whole joint: articular cartilage, subchondral bone, synovium, tendon and muscle, characterized by degeneration of articular cartilage, synovitis and alterations to peri-articular and subchondral bone. The repairing role is played by IGF-1 and TGF-beta, stimulating the biosynthesis of proteoglycans and collagen, and reducing the number of IL-1 receptors on chondrocytes, and in OA, bone morphogenetic bone protein (BMP)-7 decreased. Administration of BMP-7 to the joints reduces experimental degenerative disease in animals and is currently in human phase I trial. Research is being conducted on the regulation of cytokine production and metalloproteinases (MMPs), involved in the destruction of cartilage, on gene therapy involving the introduction of genes encoding proteins that improve cartilage synthesis into joints. Sprifermin (recombinant human fibroblast growth factor 18) is under development for the treatment of OA. Tanezumab is a monoclonal antibody against nerve growth factor; this drug is effective at relieving pain and improving function in OA patients. Beside analgetics and NSAIDs current concepts in pharmacological treatment of OA are follows: inducible nitric oxide synthase (iNOS) inhibitors, MMP inhibitors, proinflammatory cytokine blockers, regulators of apoptosis, regulators of mitochondrial function, nutraceuticals and herbal medicine. Techniques that cause multipotent adult mesenchymal stem cells (MSCs) to differentiate into cells of the chondrogenic lineage have led to experimental strategies to investigate whether MSCs instead of chondrocytes can be used for the regeneration of articular cartilage. These strategies include use of MSCs as progenitor cells to engineer cartilage implants that can be used to repair chondral and osteochondral lesions. MSCs could be used as producers of bioactive factors to initiate endogenous regenerative activities in the OA joint. Their activities might be further enhanced via targeted gene therapy. Delivery of MSCs might be achieved either by direct intra-articular injection or by implantation of engineered constructs derived from MSC-seeded scaffolds.

Biography

Margaret Wislowska is the Head of The Department of Internal Medicine and Rheumatology CSK MSW is a specialist in internal medicine, rheumatology, rehabilitation medicine, hypertension, and the author of over 200 scientific papers and books. She has participated in numerous scientific meetings and is a promoter of 14 PhD theses. She took trainings at Guy and St. Thomas' Hospitals in London, Charity Hospital in Berlin, Rheumatology Institutes in Prague and Moscow. In 2003, she started the Department of Internal Medicine and Rheumatology and in 2010 the Clinic of Internal Medicine and Rheumatology CSK MSW. She is the Professor at the Warsaw Medical University.

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