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Title

Why is osteoarthritis now considered a preventable disease and why is that important?

Priority 1 (Research Category)

Geriatrics

Presenters

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Abstract

Context: Osteoarthritis (OA) is a common cause of pain and disability, associated with a declining quality of life and decreased longevity. Although once thought to be due to “normal wear and tear”, advances in understanding the biomechanics and cellular pathology of OA have led to a recent paradigm shift to OA as “a wound that doesn’t heal”, which suggests it could be preventable. Objective: To summarize the biomechanical and cellular evidence on the causes and treatment of OA that are consistent with this paradigm shift, using knee osteoarthritis (KOA) as an example. Study design and analysis: A mechanism-of-disease evidence synthesis drawing on complexity science was conducted to identify: 1) the key cells involved in the normal healing and repair process, 2) how these cells get dysregulated in KOA primarily by misalignment and repetitive injuries, leading to chronic inflammation that arrests the normal repair process, and 3) outcome and biomechanical research on physiotherapy and tai chi that indicate these treatments may help re-establish good biomechanics and the normal cellular repair process. Results: Adverse biomechanical forces on the knee dysregulate the key cells involved in healing and repair in the knee -- synoviocytes, chondrocytes, osteoblasts, and fibrocytes -- leading to chronic inflammation, progressive destruction of the joint and fibrosis. Physiotherapy and tai chi improve the biomechanical forces on the knee, stabilize the joint, and help to prevent injury, which explain why they are both included in national and international guidelines for KOA. Conclusions: Physiotherapy and tai chi address the root causes of KOA and can prevent progression of this debilitating disease. Following a course of physiotherapy, community-based options such as tai chi, offer a sustainability strategy for people with KOA to maintain their level of physical activity, foster quality of life and promote longevity. This cellular evidence is changing the treatment strategy of OA from symptom control towards regenerative rehabilitation and salutogenesis, or the processes involved in maintaining and restoring health.